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MÉMOIRES

ET

COMPTES RENDUS

DE LA

SOCIÉTÉ ROYALE

DU

CANADA

POUR L'ANNÉE 1891.

TOME IX.

MONTRÉAL:
DAWSON FRÈRES, LIBRAIRES-ÉDITEURS.
1892.

PROCEEDINGS

AND

TRANSACTIONS

OF THE

ROYAL SOCIETY

OF

CANADA

FOR THE YEAR 1891.

VOLUME IX.

MONTREAL:
DAWSON BROTHERS, PUBLISHERS.
1892.

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ROYAL SOCIETY OF CANADA.

PROCEEDINGS FOR 1891.

TENTH GENERAL MEETING, MAY, 1891.

SESSION I. (*May 27th.*)

The Royal Society of Canada held its tenth general meeting in the William Molson Hall, Montreal, on Wednesday, May 27th. The President, Very Rev. Principal George M. Grant, D.D., LL.D., took the chair at 10.30 o'clock a.m. and formally called the meeting to order.

The Acting Secretary, Dr. George Stewart, F.R.G.S., in the regretted absence of the Hon. Secretary, Dr. J. George Bourinot, C.M.G., read the roll of members, and the following answered to their names:—

LIST OF MEMBERS PRESENT.

L'Abbé Casgrain, l'Abbé Cuoq, Paul de Cazes, A. D. De Celles, Faucher de Saint-Maurice, Louis Fréchette, Napoleon Legendre, J. M. Lemoine, F. G. Marchand, Jos. Marmette, B. Sulte, Mgr. Tanguay, Joseph Tassé, l'Abbé Verreau, Rev. Æneas McD. Dawson, G. T. Denison, Principal Grant, W. Kingsford, George Murray, Rev. J. Clark Murray, Evan McColl, Rev. G. Patterson, John Reade, C. G. D. Roberts, George Stewart, Jr., Rev. W. H. Withrow, C. Baillairgé, H. T. Bovey, C. Carpmael, N. F. Dupuis, Sandford Fleming, Dr. Girdwood, F. N. Gisborne, Mgr. Hamel, B. J. Harrington, G. C. Hoffmann, A. Johnson, T. Macfarlane, J. G. MacGregor, L. W. Bailey, T. J. Burgess, G. M. Dawson, Sir W. Dawson, J. Fletcher, Sir James Grant, l'Abbé Laflamme, G. Lawson, J. Macoun, G. F. Matthew, A. H. Mackay, T. W. Mills, D. P. Penhallow, W. Saunders, A. R. C. Selwyn, J. F. Whiteaves.

The President then introduced Sir Donald A. Smith, President of the Montreal Reception Committee, Rev. Dean Carmichael, Mr. James McShane, M.P.P., Mayor of Montreal, Dr. J. L. Leprohon, Senator Ed. Murphy and Sir William Dawson, LL.D., who briefly addressed the meeting. After remarks by the President, Vice-president and Hon. F. A. Walker, President of the

Boston Institute of Technology and member of the National Academy of Sciences at Washington, the Acting Secretary read the following

Report of Council.

The Council have the honour to submit their tenth annual report.

In the month of May last the Council appointed the following gentlemen to act as members of the Printing Committee, viz. :—Sir William Dawson, Professor Alex. Johnson, Abbé Verreau, Dr. Fréchette and Dr. Bourinot.

The eighth volume of the Transactions has been issued two or three weeks earlier than usual, and is, in some respects, the most interesting that has yet been published. It contains 76 pages more than Vol. 7, 212 more than Vol. 6, and as much as the thickest of the preceding volumes, excepting Vol. 1, which was the report of two sessions' work. The cost of illustrations has been heavier than in any preceding volume excepting Vol. 1. The cost of alterations and corrections has been one-third less than last year, owing to the suggestions made for the guidance of members in last year's report. The regular number of copies has been circulated throughout the Dominion, and the publishers are now despatching the volumes that are annually sent to the United States, Europe and other parts of the world. Arrangements have been completed for circulation in South America, and letters have been already received from that country showing the interest taken in the publications of the Society. At a time when the attention of Canadians is being directed to trade with the West Indies and the Southern Republics, it is hoped that the Transactions, containing as they do numerous essays on the natural resources, the governmental institutions, and the history of Canada, will be found of service to the Dominion.

The accounts for the printing and publication of the Transactions are appended to this Report. The Hon. Secretary has also added a summary of the current expenses in connection with the publication of proceedings and the general work of the Society, as he has expressed his wish, in a letter to the President, to retire from his present position, which he has held for nearly ten years—in fact, since its provisional organization in December, 1881.

The Royal Society now occupies an excellent position, and the Hon. Treasurer has also on hand a considerable sum—$426.25—arising from subscriptions, which the Hon. Secretary has always considered should be kept available for general purposes when the Society is in a position to have suitable offices and a sufficiently paid organization for carrying on its work.

The Report of Council in 1890 was exceptionally elaborate and contained a good deal of information with respect to the operations of the Society at home and abroad, and numerous suggestions for the future. As the report has been published in the Transactions for 1890, and also in a separate pamphlet, it is probable that members have taken pains to study its contents. Among the recommendations that it is hoped will be acted upon sooner or later is one which has been suggested by the Hon. Secretary, with the view of making each annual volume as complete an epitome as possible of the literary and scientific work of the Dominion. For the information of Fellows and Delegates, and all others interested in this matter, the recommendation is given again in full:—

" In addition to giving in the Transactions of the Royal Society an annual review of the work of the various scientific and literary societies of Canada, the Hon. Secretary suggests the publication in each volume of as full a statement as possible of all the books, pamphlets and magazine articles, written every year by Canadian authors, with some special reference to works of more than ordinary merit. Such a statement, it is believed, will add to the value of the Transactions both at home and abroad, since it will give some definite details of our intellectual progress, and, at the same time, assist the labours of all those engaged in Canadian studies. In order that this review may be made as perfect as possible, the members of the Society should take pains to keep the Hon. Secretary fully informed of all books, pamphlets and essays written by themselves, apart from those articles that they

have delivered before the Societies, whose work is already annually given in the Transactions. If this idea finds favour, it is proposed that the first statement appear in the next volume, if members will lose no time in giving the Secretary the information he desires."

The vacancies that have for some time existed in the Second and Third Sections have not yet been filled up. In accordance with the rules, the nomination of Professor Cappon, of Queen's University, was made for the vacancy in the Section of English Literature, but he did not receive anything like the two-thirds vote necessary to elect him. In the Section of Mathematical, Physical and Chemical Sciences there were five nominations to fill three vacancies, viz.:—

T. C. Keefer, C.E., C.M.G.
Dr. W. L. Goodwin.
Dr. Salluste Duval, M.A.
Dr. W. H. Ellis.
M. de Foville.

Of these five gentlemen, three received nine each, viz., Dr. Ellis, Dr. Goodwin and Mr. Keefer. M. de Foville received eight, and Dr. Duval five votes.

Under all the circumstances the Council simply report the facts for the consideration of the Society, but they must, at the same time, call attention to the unsatisfactory character of the rule under whose operation the vacancies in the Third Section have not been filled up for three years. No attempt has been made in any section to carry out the provisions of the amendment of last session, which permits the election of an additional member each year, until the number of a section reaches its maximum of twenty-five Fellows. It is certainly inexpedient that difficulties should be created to prevent the bringing in, whenever necessary, of men engaged in active intellectual work throughout the Dominion, whose coöperation will be found of service to the Society. The object of the Society is to make itself, as far as possible, the centre of the best literary and scientific thought of Canada, and if it is to succeed in this way it must have the earnest aid of all workers in this country.

During the meeting of 1890, the Royal Society had the honour of communicating a resolution to His Excellency the Governor-General, asking him to take such steps as might be necessary to secure the coöperation of the Astronomer Royal at Greenwich in a telegraphic determination of the exact longitude of Montreal. His Excellency interested himself actively in this project, and Her Majesty's Government has assented to the Royal Observatory taking part in the undertaking, as the following communication from the Colonial Office indicates:—

Lord Knutsford to Lord Stanley of Preston.

Copy.
Canada.
No. 245.

DOWNING STREET, 24th DECEMBER, 1890.

MY LORD,—With reference to your despatch No. 107 of the 2nd of June last, relating to the wish of the Royal Society of Canada to secure the coöperation of the Astronomer Royal at Greenwich in the matter of the determination of the exact longitude of Montreal, I am directed by Lord Knutsford to transmit to you, for communication to your Government, copies of a letter from the Astronomer Royal, and of one from the Board of Admiralty, from which it will be seen that Her Majesty's Government have assented to the Royal Observatory joining in the undertaking,

I have, etc.,

KNUTSFORD.

The Governor-General.

Greenwich Observatory to Colonial Office.

Copy. ROYAL OBSERVATORY, GREENWICH, 21st JUNE, 1890.

SIR,—With reference to your letter of the 20th instant, transmitting copy of a communication from the Royal Society of Canada respecting the proposed determination of the longitude of Montreal by exchange of telegraphic signals with this Observatory, I beg that you will inform Lord Knutsford that personally I shall be happy to coöperate in the undertaking, but as funds would be required I would suggest that the communication should be sent officially through the Admiralty.

I may mention that I brought the question before the Board of Visitors of the Royal Observatory in my annual report (copy enclosed), and that the Board at their meeting on the 7th instant passed the following resolution :—"This Board is of the opinion that the telegraphic determination of longitude is a matter of very great importance, and that the necessary instrumental appliances should be obtained in order that the Royal Observatory may efficiently take part in such determinations."

I am, etc.,

W. H. M. CHRISTIE,
Astronomer Royal.

The Under Secretary of State, Colonial Office.

Admiralty to Colonial Office.

Copy. ADMIRALTY, 18th DECEMBER, 1890.

SIR,—With reference to your letter of the 26th June last, forwarding copies of correspondence on the subject of the coöperation of the Astronomer Royal with the Royal Society of Canada, for the purpose of determining the exact longitude of Montreal, I am commanded by my Lords Commissioners of the Admiralty to acquaint you that Her Majesty's Treasury has assented to the Royal Observatory joining in the undertaking, and to the proposed expenditure of £350 for instruments and £300 for operations connected with this work, which sums will be included under Vote C of Navy Estimates, 1891-2.

I am, etc.,

EVAN MACGREGOR.

The Under Secretary of State, Colonial Office.

On the receipt of this communication the Council of the Royal Society at once sent a memorial to the Honourable the Minister of Marine, representing to him that it is of great importance that the Dominion Government should coöperate with the Imperial authorities in aiding this desirable undertaking. The Council, in the course of this memorial, dwelt on the following considerations, which show the importance of the contemplated work :—

1. The geographical position of Montreal has been more accurately determined than that of any other city or town in Canada, and the positions of other places in the Dominion have been determined by reference to it. But the position of Montreal itself, or, to speak more precisely, of McGill College Observatory, has been determined by reference to Harvard Observatory. Now doubt has been recently thrown on the accuracy of the result of the observations by which the longitude of Harvard Observatory was obtained. This doubt, of course, affects the positions of all places determined by reference to it—that is to say briefly, it affects the whole geography of the continent. As there are better means available at present for observations and interchange of signals across the Atlantic than

at the time of the American determination, it is deemed of great importance that an effort should at once be made to remove the doubt referred to.

2. The Department of Marine, more particularly, is interested in the work, as it affects navigation. The accurate determination of a ship's position at sea, and, therefore, often the safety of the ship depend on the chronometer. The error of the chronometer has always to be ascertained in leaving a Canadian port by reference to the local time, and the longitude of place referred to Greenwich. This Canadian longitude again is determined by reference to the longitude of the base station, such as Montreal or Harvard Observatory, hence the necessity for extreme accuracy for the base station.

3. The object to be attained is not only of Canadian but of Imperial, and not only of Imperial but of International importance.

The following is a summary of the facilities at present offered for the undertaking (including those already mentioned above) :—

1. A grant of £650 stg. from the Imperial Treasury.

2. The aid of the Royal Observatory, Greenwich, with instruments and observers.

3. The free use of the cable and telegraph lines of the C. P. R. Telegraph Co. (This has been promised.)

4. The aid of the McGill University, Montreal, with instruments and observers.

All that is further required is a grant from the Dominion Government similar to that given by the Imperial Government for special instruments and general expenses. The amount estimated as necessary is $2,000.

The Honourable Charles H. Tupper, Minister of Marine, it is satisfactory to learn, has fully appreciated the importance of carrying out the scheme to a successful completion, and in answer to the memorial of the Society has written that he has brought the subject to the attention of His Excellency the Governor-General-in-Council with a view to its consideration in the preparation of the estimates to be laid before Parliament.

In answer to the hospitable invitation of the members of the Natural History Society, and of other citizens of Montreal, the Council of the Royal Society, last autumn, made all the arrangements possible on their part for the present meeting. A joint committee of all the Fellows resident in Montreal, and of the members of the local committee, was at once formed to accomplish the objects in view. The interesting little volume issued under the auspices of the Montreal committee furnishes not only a brief sketch of the work of the Royal Society, but other information necessary for Fellows, delegates and associate members who are to take part in the proceedings. Invitations to the meeting have been issued on behalf of the Society to a number of eminent men engaged in scientific and literary pursuits in Europe and America. Among those so invited were the Marquis of Lorne, the founder of the Society, and several distinguished gentlemen connected with the French Academy, who are corresponding members of the Society. It is to be regretted that none of these gentlemen could possibly attend on this occasion, but all of them have sent letters of regret, in which they express their warm appreciation of the work of the Society, and earnestly wish it every success :—

KENSINGTON PALACE, KENSINGTON, MARCH 13, 1891.

GENTLEMEN,—I have to-day received your most kindly invitation to be at Montreal for the meeting of the Royal Society in May, and to my great grief can only thank you, and say with what sorrow it is that I cannot be with you.

Duties on this side of the water tie me down, and I can only be with you in thought and sympathy.

The steadfast hold the Royal Society has now taken in the land shows that your efforts to have such a National Society have been successful. I never doubted that it would succeed, for its object was to unite together the leading spirits of the Dominion in literature and science, that they might together, year by year, exhibit to the people their glorious history in the past, and prove to them that they have a country whose mere material wealth is so great that with a proper, manly and determined courage, such as their fathers showed, they can make famous a land second to none in the world. Thus practical science goes hand in hand with the two greatest modern languages to fortify your hearts and make the sons of Canada worthy of their God-given national destiny.

They who weave fictitious plots for her disappearance from the stage of history little know the honest and simple force that guides her onward to run her own course.

I believe it will be a satisfaction to you in the future to think that, as members of this Society, you have had a part in the sentiment which makes Canada a people able to lift up her head to ask God to bless her progress, and to rely upon herself with His divine aid.

I remain, Gentlemen,

Your obedient servant,

LORNE.

Dr. Jno. George Bourinot:

DEAR SIR,—Your obliging letter reached me yesterday. It would give me a great deal of pleasure to attend the meeting of the Royal Society of Canada on the 27th of May, but the state of my health—being held prisoner by chronic gout in the knee joints—compels me to lose that satisfaction.

With many thanks, I remain,

Very sincerely yours,

50 Chestnut street, Boston, 7th March, 1891. F. PARKMAN.

23 DENNING ROAD, HAMPSTEAD, N.W., APRIL 3, 1891.

SIR,—I regret to say that it will not be possible for me to visit America this year, and so I cannot avail myself of the courteous invitation of the Royal Society of Canada.

I remain,

Faithfully yours,

T. G. BONNEY.

NATIONAL ACADEMY OF SCIENCES,

WASHINGTON, D.C., MAY 23, 1891.

John George Bourinot, C.M.G., LL.D., D.C.L.,

Honorary Secretary Royal Society of Canada:

SIR,—I have the honor to acknowledge the invitation of the Royal Society of Canada, extended to the National Academy of Sciences, to send a delegate to the meeting of your Society, May 27th, and to inform you that I have requested the Hon. Francis A. Walker, of Boston, Vice-president of the National Academy of Sciences, to represent the Academy on that occasion.

I am, Sir, with high respect,

Very truly yours,

O. C. MARSH,

President National Academy of Sciences.

FLORENCE, ITALY, MARCH 23, 1891.

DEAR SIR,—The kind letter signed by yourself and the Secretary of the Citizens' Committee of Montreal, inviting me to Montreal at the meeting of the Royal Society of Canada in May, reached me here.

I have been abroad since last July and shall not be able to return to America till some months after the intended meeting has taken place. I regret this exceedingly, for it would have been very pleasant for me to have met my associates of the Royal Society in Canada, and to have testified in person my sense of the kindness of yourself and the other gentlemen who signed the letter, as well as my appreciation of the great goodness of those of the Society and of the citizens whom they represent.

Believe me, dear Mr. Bourinot;

Faithfully yours,

JUSTIN WINSOR.

J. G. Bourinot, C.M.G., LL.D., etc., Hon. Secretary Royal Society, Canada.

S. S. "CITY OF NEW YORK," MID-OCEAN, MAY 16, 1891.

GENTLEMEN,—I regret my inability to be present at the meeting of the Royal Society of Canada as one of the representatives of the American Social Science Association, owing to my departure for Europe. I had expected to have this pleasure up to the day before I sailed.

Very respectfully,

FREDERICK PETERSON.

To the Local Secretaries Royal Society of Canada, Montreal.

8 AVRIL 1891, 10 RUE DE BABYLONE.

MONSIEUR ET CHER CONFRÈRE, — Je suis très touché et très reconnaissant de la lettre que vous avez eu la bonté de m'adresser. Je voudrais bien retourner dans ce beau Canada où j'ai été reçu il y a quarante-deux ans, avec tant de gracieuseté. Je voudrais bien rejoindre, à Montréal, la Société Royale à laquelle j'ai l'honneur d'appartenir.

A l'accomplissement de ces excellents désirs, hélas! il me faut renoncer.

J'ai passé l'âge du psalmiste. Soixante-dix ans, dit David, quatre-vingts ans pour les forts, et au-delà: labor et dolor.

A la St-Jean prochaine, j'entrerai dans ma quatre-vingt-quatrième année. Grâce à Dieu, labor et dolor ne me tourmentent point. Cependant je n'ai pas la force nécessaire pour entreprendre un long voyage. Je dois me résigner à vivre dans la retraite.

Mais le 27 mai, je serai pour la journée de tout cœur avec vous à la réunion de Montréal, comme je serai, tant que je vivrai, de cœur avec votre noble Canada.

Veuillez, Monsieur et cher confrère, présenter mes compliments et mes regrets à l'assemblée de Montréal, et agréer l'expression de mes sentiments les plus distingués.

XAVIER MARMIER,

De l'Académie française, membre correspondant de la Société Royale du Canada.

LIÉGE, LE 17 AVRIL 1891.

Monsieur Jn. Geo. Bourinot, Secrétaire général de la Société Royale du Canada, à Ottawa :

MONSIEUR LE SECRÉTAIRE-GÉNÉRAL,— Par lettre du 17 mars dernier, vous me faites l'honneur de porter à ma connaissance que la Société Royale du Canada tiendra, le 27 mai prochain, à Montréal, sa dixième session annuelle; vous me mandez en outre, qu'afin de donner le plus d'éclat possible à ces assises solennelles, la Société a pris la résolution d'y convier sans distinction de nationalité, un certain nombre de personnes connues par leurs travaux sur les sciences ou à raison de leur mérite littéraire, ou encore par la part qu'ils ont prise aux progrès des études historiques.

Vous ajoutez que cette gracieuse invitation n'émane pas seulement de la Société Royale, mais en même temps d'un Comité de citoyens de Montréal, institué pour assurer une cordiale hospitalité, à cette occasion, aux hôtes étrangers attendus dans la cité.

La Société a bien voulu porter sur la liste des invités son modeste correspondant de Belgique. Mon premier devoir est de lui en témoigner ma reconnaissance; j'ose espérer que vous voudrez bien vous faire auprès d'elle l'interprète de mes sentiments, et du même coup, auprès du Comité des citoyens. Hélas! ma santé chancelante ne me permet pas d'entreprendre un long voyage; elle est même assez précaire pour me forcer d'interrompre pendant quelque temps mes travaux ordinaires. Je ne désespère pas cependant de donner signe de vie à la Société Royale; en attendant, je suis obligé de me résigner à n'assister qu'en esprit à vos doctes et intéressantes délibérations.

Qu'il me soit permis de déclarer que les regrets que me fait éprouver cette abstention forcée sont rendus plus amers par cette circonstance, que mon honorable et regretté ami Pierre J. O. Chauveau s'était chargé de me faire apprécier le Canada, il y a déjà de bien longues années. J'avais toujours compté qu'il me serait donné quelque jour d'étudier directement un peuple vaillant et généreux, que je crois appelé, tôt ou tard, à de glorieuses destinées. — Mes espérances ne se réaliseront pas. Je me consolerai en prenant connaissance des travaux de la session de Montréal, et au besoin en les faisant connaître à mes compatriotes.

Veuillez agréer, monsieur le Secrétaire-général, l'hommage de ma plus haute considération.

ALPHONSE LEROY.

INSTITUT DE FRANCE, ACADÉMIE FRANÇAISE, PARIS, LE 10 AVRIL 1891.

Le Secrétaire perpétuel de l'Académie à monsieur le Secrétaire général de la Société Royale du Canada :

MONSIEUR ET CHER CONFRÈRE, — Je reçois avec une vive reconnaissance la lettre par laquelle le Comité collectif de la Société Royale du Canada, et des citoyens de Montréal veut bien me faire l'honneur de m'inviter à la grande réunion littéraire qui aura lieu le 27 mai prochain.

Rien ne me serait plus agréable que de pouvoir me rendre à ce gracieux appel, et d'avoir ainsi l'occasion de trouver des amis nouveaux dans votre beau pays, si cher à la France!

Malheureusement pour moi, une élection importante aura lieu à l'Académie le jeudi 21 mai, en remplacement d'Octave Feuillet, et je ne puis m'absenter dans un pareil moment.

Cet obstacle n'existerait pas, que j'aurais, hélas! une autre excuse, plus sérieuse encore et plus triste, que j'aime mieux ne pas invoquer.

Le 16 du mois prochain, j'entrerai dans ma quatre-vingtième année, et les longs voyages me seront désormais interdits, comme les longs espoirs!

Avec mes remerciements, pour vous et pour vos collègues des comités unis, veuillez agréer, monsieur le Secrétaire général, l'assurance de ma haute considération, de ma cordiale sympathie et de mon entier dévouement.

CAMILLE DOUCET.

PARIS, LE 27 AVRIL 1891, RUE DU PRÉ-AUX-CLERCS, NO 7.

MONSIEUR, — J'ai l'honneur de vous accuser réception de votre lettre du 17 mars, dans laquelle vous voulez bien me transmettre l'invitation cordiale que le comité supérieur de la Société Royale veut bien m'adresser pour sa réunion du 27 mai prochain.

Veuillez, je vous prie, les assurer combien je suis sensible à leur aimable attention, et combien je les remercie de l'honneur qu'ils veulent bien me faire. Malheureusement la distance de Paris à Montréal est bien grande, et serait pour moi d'autant plus difficile à franchir cette année, que mon fils, atteint en ce moment d'une maladie très grave, nous inspire de très sérieuses inquiétudes.

Je prie donc messieurs les honorables membres de la Société Royale, et le Comité des citoyens de la ville de Montréal, d'agréer l'hommage de ma reconnaissance, et les regrets bien vifs que j'éprouve de ne pouvoir répondre au témoignage de leur obligeante sympathie. Personne plus que moi ne regrette de ne pouvoir assister à cette réunion solennelle d'hommes si éminents, et de visiter de nouveau ce beau pays du Canada, que j'aime et que j'apprécie à tant de titres.

J'ai l'honneur d'être,

Monsieur,

Votre tout dévoué serviteur,

E. RAMEAU DE ST-PÈRE.

Je profite de cette lettre pour vous remercier de l'envoi des volumes si beaux et si intéressants, qui renferment les travaux de la Société Royale du Canada, et que je reçois tous les ans avec tant de plaisir.

Among the distinguished people who have promised to attend the meeting are the following:—

1. Mrs. Martha J. Lamb, the editor of the 'Magazine of American History,' and the author of the well known "History of New York."

2. Hon. Andrew D. White, LL.D., the former President of Cornell University, who represents the American Historical Association.

3. General Francis A. Walker, President of the Massachusetts Institute of Technology, who represents the American Economic Association.

4. Professor Albert B. Prescott, of Michigan University, who represents the American Association for the Advancement of Science, of which he is President-elect.

5. Mr. Stuart Wood, Ph.D., of Philadelphia, who represents the American Academy of Political and Social Science.

6. Major John W. Powell, Director of the Geological Survey of the United States, who represents the Geological Society of America.

The American Social Science Association have also designated the following members of their Council to represent that Association at this meeting:—

Andrew Dickson White, LL.D., President; Anson Phelps Stokes, Treasurer; F. B. Sanborn, General Secretary; F. J. Kingsbury, Esq., Waterbury, Ct.; Hon. Carroll D. Wright, Washington, D.C.; M. Hotchkiss, Esq., Hartford, Ct.; Frederick Peterson, M.D., 201 West 54th street, New York City.

The attendance from the affiliated societies in Canada is expected to be exceptionally large. The following is a list of those societies:—

Delegates to attend Annual Meeting, May, 1891.

Society.	Place.	Delegate.
Canadian Literature	Montreal	Mr. G. Martin and Mr. A. Weir.
Natural History Society	do	Very Rev. Dean Carmichael.
Numismatic and Antiquarian Society	do	Mr. Justice Baby.
Microscopical Society	do	Dr. Girdwood.
Society of Historical Studies	do	
Société Historique	do	Mr. Justice Baby.
Cercle Littéraire et Musicale de Montréal	do	M. Théodore Lafleur.
Literary and Historical Society	Quebec	Very Rev. Dean Norman, D.D.
Geographical Society	do	Hon. Lt. Col. Rhodes.
Institut Canadien	do	M. Thomas Chapais.
Literary and Scientific Society	Ottawa	Mr. H. B. Small.
Field-Naturalists' Club	do	Dr. R. W. Ells.
L'Institut Canadien-Français	do	M. Napoléon Champagne.
Hamilton Association	Hamilton	Mr. T. McIlwraith.
Murchison Scientific Society	Belleville	
Entomological Society of Ontario	London	Rev. Thos. W. Fyles.
Canadian Institute	Toronto	Alan Macdougall, C.E., or Mr. Carpmael as substitute.
Natural History Society of N. B		Mr. G. U. Hay.
N. S. Institute of Natural Science	Halifax, N. S.	Mr. Maynard Bowman.
Historical Society of Nova Scotia	do	Mr. F. Blake Crofton.
Natural History Society of B. C.	Victoria, B. C.	Dr. Chas. F. Newcombe.
Wentworth Pioneer and Historical Society	Hamilton, Ont	Mr. Geo. H. Mills.
Elgin Historical and Scientific Institute	St. Thomas, Ont.	Mr. J. H. Coyne.
Natural History Society of P. E. Island	Charlottetown	
Pen and Pencil Club	Montreal	Dr. S. E. Dawson.
Historical Society of Manitoba	Winnipeg	Rev. G. Bryce, D.D.

It is with much pleasure that the Council of the Royal Society are able to record the growing interest that is taken throughout the Dominion in historical investigations bearing on the archæology, the ethnology, and the constitutional development of Canada. Some twenty-five or thirty years ago, with the exception of half a dozen local societies, working quietly and unostentatiously in important centres like Halifax, Quebec, Montreal and Toronto, little or nothing was done in this direction. Dr. T. B. Akins, an earnest and conscientious student of history, whose death has been recently announced, laboured for years to collect old historic annals that were mouldering in the dust of the Nova Scotia archives. Men like the Rev. Dr. Patterson, of New Glasgow, now one of the most industrious Fellows of the Royal Society, as the last volume of the 'Transactions' shows, devoted himself to the

record of county history, and his example was followed by other students throughout the Dominion. Societies like the Quebec Literary and Historical Society, and the Canadian Institute of Toronto, have since their foundation done most meritorious work in this way, and it is encouraging to note that the example of those pioneers in historical researches is being followed by younger associations throughout Canada. The list of societies affiliated with the Royal Society is increased this year by the addition of several bodies which have been established expressly for the preservation of local historical memorials.

The Canadian Institute of Toronto, we are glad to note, is renewing its activity under the most encouraging auspices. Its delegate will give you a complete report of the work it has already accomplished during the past year, and of what it has now in view; but there are some features of its operations which are deserving of special mention here, since they illustrate the character of the work that every society in Canada should endeavor to achieve. The following from the Secretary on this point will be heard with interest:—

"A movement to preserve the ancient monuments relating to Indian habitation and the settlement of the country by its earliest pioneers first took the form of archæological research, to which influential aid has been rendered by the Government of the Province of Ontario. This has led almost imperatively to the study of our early history necessitating the collection of documents, public and private, either for preservation in public repositories or for their being copied and published. A summer convention held at Niagara last July was successful in interesting many local historians and afforded them opportunities of making public and recording what would otherwise have passed into folk lore in the next generation. The proposed convention at Penetanguishene will undoubtedly create a like interest in that quarter. The Institute extends an invitation to the members of the Royal Society to take part in this convention. There are numerous students of history all over the Dominion who would gladly embrace a well considered plan for the publication of historical documents, and the preservation of papers public and private now in private possession. Each year adds to the value of such documents, and the collection of these for publication, if not for preservation, surely should commend itself to the Royal Society. The Institute invites the coöperation of the Society in this movement."

The Quebec Government has done a useful work for some years past in publishing in a handsome and permanent form a large number of documents relating to the government and the history of Canada under the French *régime*. It is encouraging to all students of our time to find that the important work commenced some time ago by the Government of the Dominion for the collection of Canadian archives in Europe and America continues to be most efficiently conducted. Though not a few who hear or read this report are fully cognizant of the work that has been accomplished, the public generally is not yet so fully informed as it ought to be of what has been and is being done in this way, and it will therefore be useful to give a short summary of the nature and operation of what is now a most valuable branch of the public service.

The very serious hindrances to the prosecution of historical research in Canada, from the want of anything approaching to the nature of a public record office, led to a strong representation on the subject being made to Parliament in 1871. Immediate action was taken and the Minister of Agriculture was empowered to take the necessary preliminary measures towards complying with the prayer of the petition. In 1872 a sum was granted by Parliament, and, after careful consideration, Mr. Douglas Brymner was selected to take the immediate supervision of the service thus determined upon.

The annual reports submitted by Mr. Brymner to the Minister of Agriculture on the progress made in the collection of documents to form part of the Archives attest the energy with which the work has been conducted. They show that the first important collection obtained was the military correspondence from about 1784 to 1870, which had been sent to Halifax to be forwarded to the War

Office in London; this, after lengthened correspondence and personal negotiation, was transferred in 1873 to the Archives Branch at Ottawa. The correspondence when received was found to be carefully tied together by years, but no attempt had been made to arrange the documents systematically, so as to make them accessible and useful.

The thoroughly efficient manner in which the task of collating and arranging this collection, stated in the report on archives to have weighed eight tons, is shown by the acknowledgments of so many writers of Canadian and United States History. Several, in fact, state in their works that they have been obliged to rewrite history whose correctness has been assumed for years, but which now, from the evidence found in the Canadian documents, was found to be erroneous and misleading.

Besides this official correspondence, much valuable information is to be obtained from papers deposited among the archives by the descendants of men who took a part in the early history of Canada. It is such collections as these that give so great a value to the documents in the British museum, and without which the merely political records would be of comparatively small worth. The researches of the Historical Manuscripts Commission in Great Britain have been of inestimable value in bringing to light the documents preserved by old families, but unknown and inaccessible until the appointment of the Commission. In Canada this care has only with difficulty been exercised for the preservation of the most important documents, and when it has been shown by one generation, the second, or at the furthest, the third generation too frequently frustrates the intentions of the collector of the family records and ruthlessly destroys them, causing a gap in history which can never be supplied. Had the original collector who devoted care and thought to a task which he believed would be of benefit to his posterity, or had his descendants transmitted the collection to the Archives Branch at Ottawa, this destruction would have been avoided and the papers placed in such relation to other documents as to bring out their full worth, the value of documents amounting, as a general rule, to very little, so long as they are detached and separate from the series in which, under intelligent supervision, they would naturally be placed. The apparent worthlessness due to this detached condition no doubt accounts to a considerable extent for the wilful destruction of so many family records.

The acquisition of copies of the British State papers is another important part of the work. The history of Canada, from its cession to Great Britain, has hitherto been very obscure, the absence of full and authentic records leaving room for great doubt and uncertainty respecting the real cause of events. The reports of the Archivist show that the duty of securing the official records has been carefully attended to, and that every precaution has been taken to secure accurate transcripts and to guard against errors. Details of the operations of the Archives Branch are to be found in the annual reports to which attention may be directed.

It appears necessary only to refer, without enlarging on the subject, to the importance of having the records of the country preserved and made accessible in one central place of deposit, not scattered, and, if not inaccessible, certainly very difficult of access. The Archives Branch of the Department of Agriculture affords such a place of security, besides, which is a most important consideration, a distinct classification and easy reference, the documents received being arranged, bound and indexed immediately after receipt.

Before leaving this important and interesting subject of historic research, which falls naturally under the purview of the Royal Society, and its affiliated bodies, the Council thinks it a duty also to refer to the necessity of preserving as far as possible such memorials as may remain in historic towns of the old days of Canada. It would be a pity if every old building that exists in cities like Quebec, Montreal and Halifax, and has some special significance in history, should entirely disappear under the dominant influences of enterprise and improvement, so characteristic of these modern times. Such buildings as are essentially illustrative of some epoch in our history should, when practicable, be preserved for a useful purpose. The old South Church in Boston is one of the monuments that the people of that interesting city have preserved to revive their historic past. Mount Vernon is another

memorial which our neighbors possess to recall the services of the great men that their country can claim. It is well at times to forget this practical prosaic present, and have our thoughts carried to the various stages of our country's progress, and be forced in this way to remember the services of the men who struggled amid many difficulties to give Canada a position among the prosperous countries of the world. The past has its many lessons for us who live in the present, and it would be well to have always before us something to remind us what we owe to its struggles and achievements.

The historic buildings of Montreal have nearly all disappeared. The last vestige of the old wall was swept away to clear the site of the Dalhousie Square Railway Station. The quaintly picturesque architecture of the Bonsecours Church has been marred by what is called restoration. Two towers of the old *Fort de la Montagne* alone remain to tell of the stormy youth of Montreal. There are a few private houses left which reach back into the old French *régime*, but they are few and are much altered. The western end of the Seminary still remains practically the same as when built more than 200 years ago. One public building alone remains to testify to the vicissitudes of our past history, and the eye of the destroyer is fixed upon it. This is the building opposite the City Hall known as the Chateau de Ramezay, and in spite of the alterations made in it something of the spirit of the old life of Montreal lingers round it. It was built shortly after the year 1704 by Claude de Ramezay, who had been Governor of Three Rivers, and in that year was made Governor of Montreal. He was an officer of great distinction, who had served the King in many difficult enterprises in Canada. He died in 1724. His heirs sold the building to La Compagnie des Indes, and it was the headquarters of the fur trade until that company became extinct in 1750. Shortly after the conquest the English Government bought it for an official residence of the Governors of the English *régime* when they came to Montreal. During the winter of 1775-6 Benjamin Franklin, Carroll and Chase, the Commissioners of the Continental Congress, who came here to endeavor to shake the allegiance of the French-Canadians, resided in this building. It was the headquarters of General Wooster and Benedict Arnold in 1776. After the union of 1840-1 it became the official headquarters of the Governors-General of Canada. The Earl of Elgin was the last to occupy it. A building like this is an historical object lesson. It has been associated with many brilliant soldiers and statesmen, and to destroy it wantonly is to display careless indifference to the historic past of our common country—common alike to French and English. This building was erected twenty-five years before Independence Hall in Philadelphia. That is now turned into a National Historical Museum, and any Philadelphian who should propose to sell it out for building lots would be thought insane. It was built fifteen or twenty years before Faneuil Hall in Boston. What Bostonian would dare to propose pulling that building down? If we are to have a national life the iconoclasts who seek to destroy every visible relic of our past history must be resisted.

The Council of the Royal Society now appeal to the patriotism of the Canadian people and governments to preserve this monument of the historic past by associating it with the requirements of the present and making it a national repository of those relics, memorials and archives, which will illustrate the history of Montreal and of Quebec generally, and can most conveniently and properly be kept in such a place for the information and profit of the Canadian people at large, who should consider a proposal of this kind a matter, not of mere local, but of wide national interest.

The Council, in concluding this report, ask the members of this Society to consider well the closing words of Lord Lorne's sympathetic letter and to make it their aim to promote by all the means in their power the intellectual development of this country, and to create that powerful national feeling which can alone enable Canada to preserve her autonomy on this great continent. Then in our founder's eloquent words: "It will be a satisfaction to you all in the future to think that as members of this Society you have had a part in the sentiment which makes Canada one people, able to lift up her head to ask God to bless her progress, and to rely upon herself with the Divine aid."

MONTREAL, MAY, 1891.

The Royal Society of Canada,

To Dawson Brothers, *Dr.*

For Balance from last account	$2,390 80

Cr.

By Cash	$1,500 00	
" "	250 00	
" "	500 00	
" " $240.80, of which $100 credited on new account	140 80	
		$2,390 80

For Editing	$ 300 00
" Stationery	22 70
" Postages, proofs, etc	22 88
" Paper	1,407 00
" Illustrations	611 60
" Composition	972 50
" Press work	246 00
" Alterations	234 00
" Insurance and storage	98 53
" Cases, packing, shipping expenses	66 78
" Foreign and domestic freight charges	293 59
" Binding	559 55
" " extra copies	115 00
" Sundries	16 75
" Doing up, freight and expense, authors' copies	80 85
	$5,047 73

By Balance as above	$ 100 00	
" Cash	1,500 00	
" "	800 00	
" "	80 00	
" Sales of volumes	35 00	
		$2,515 00
		$2,532 73

ACCOUNT CURRENT OF DISBURSEMENTS AND OF RECEIPTS TO MEET THE SAME IN OFFICE OF HONORARY SECRETARY FROM DECEMBER, 1881, TO MAY 27, 1891.

1882.

Advertising, *Free Press*	$ 2 00
House of Commons' messengers	12 00
Postage, 400 circulars	4 00
Printing, John Lovell & Son	12 00
Citizen, advertising	3 08
Petty expenses, etc	6 00

1883.

Fees on Royal Society Act of Incorporation	$ 216 38
200 copies of Act	2 00
Legal drafting of same	8 00
Free Press, advertising	2 00
Messengers' cheque, $10; cash, $2	12 00
Citizen office, advertising	6 10

1883.—(*Cont'd.*)

Professor Haanel, as per instructions of Dr. S. Fleming, enclosing $20 subscription	$ 20 00
Petty expenses, etc	5 50
Foreign postage	3 75
Telegrams	1 25
One blank book	0 90
Clerical assistance, translation, engrossing, from December 28, 1881, to May, 1883	84 00
Delivery of Transactions	1 50
Expressage on books from General de Peyster	0 95

1884.

Cab hire to Government House	1 50
Citizen office, printing	29 00
Clerical assistance, translation, etc., one year, at $7 a month	84 00
Expressage of books	1 00
Four messengers for attendance on general meeting	12 00
Free Press and *Citizen*, advertising	5 00
A. Fréchette, translation of rules	12 00
Illuminating and engrossing address to Governor-General and another to British Association	15 00
Foreign postage, one year	1 25
Citizen, circulars	1 50
Petty expenses	6 50

1885.

Three messengers in attendance at May meeting	9 00
Senate Messenger	4 50
Petty expenses, etc	1 00
Clerical assistance, one year	84 00
Expenses to Montreal	4 50
Walnut file case and cupboard for papers and manuscripts of society	45 00

1886.

Citizen, advertising, etc	15 20
Messengers	13 00
Citizen, circulars	24 00
Petty expenses, etc	4 25
Clerical assistance, one year	84 00

1887.

Citizen, circulars	11 00
Titles and abstracts	35 00
Messengers	13 00
Gazette, printing	8 50
Journal, advertising	2 70
Personal expenses, Montreal visit, etc	3 75
Clerical assistance, translation, etc., one year	84 00

1888.

Citizen, ballot papers, circulars, abstracts of papers, etc	$ 88 50
Free Press, advertising	2 00
Senate messenger	4 00
Clerical assistance, translation, etc	84 00
Petty expenses	3 50

1889.

Citizen, circulars, abstracts	56 75
Advertising—*Journal*, *Free Press* and *Citizen*. *Journal*, including 1888 meeting	24 00
Mortimer, binding Governor-General's address, large folio	20 00
King, illuminating and engrossing same	15 00
Messengers, including May, 1888	20 00
Petty expenses	5 00
Clerical aid, one year	84 00

1890.

A. S. Woodburn, printing, advertising	23 50
Citizen and *Free Press*, advertising	9 50
Citizen, printing abstracts, etc	32 00
Printing reports, etc., of Tidal Observations, *Gazette*	30 45
Messengers	12 00
Printing circulars for S. Fleming to accompany vol. 7	27 00
Le Canada, advertising	2 00
Clerical aid, one year	84 00
Petty expenses, cab hire, etc	2 75

1891.

A. S. Woodburn, printing	28 00
Clerical aid, translation, etc., one year	84 00
Petty expenses	2 50
Total expenditure since Dec., 1881	$ 1763 01

RECEIPTS.

Fees refunded to Hon. Secretary by House of Commons on bill	$ 200 00
Dr. Sandford Fleming's subscription to Prof. Haanel	20 00
Cash from subscriptions and other sources	$1543 01
Total	$1763 01

GENERAL STATEMENT BY HONORARY SECRETARY.

Cash in hand, May 27, 1891—

General Grant	$2631 44
Subscriptions	426 25
Total	$3057 69

Treasurer's Report of Fees.

On the 27th January, 1890, the Honorary Secretary gave me the statement of subscriptions received and due to May, 1890. This showed:—

Commutation Subscription—

Nine at $20			$180 00	

Annual Subscription—

Section 1	3	1	12 00	
Section 2	12	1	72 00	
Section 3	10	4	42 00	
Section 4	10	3	46 00	
	—	—		$352 00
	35	9		

Collected by Dr. Selwyn to May, 1891—

Annual Subscription—

Section 1	6	68 00	
Section 2	11	78 00	
Section 3	9	104 25	
Section 4	13	178 00	
	—		426 25
	39		
			$778 25

Leaving due to 1st May, 1890—

S. 1, $172; S. 2, $90; S. 3, $88; S. 4, $10	$360 00	
Less $62 due by members deceased and resigned...	62 00	
	$298 00	
8 members have paid sub. for 1891 in advance		
10 do have commuted under Rule 7		
62 do subscription due 1st May, 1891, $2	124 00	
Due to 1st May, 1891		$422 00

The minutes of the ninth general meeting, as they appear in Vol. VIII. of the 'Transactions,' were considered as read and approved.

Messrs. T. Macfarlane and James Fletcher were appointed auditors for the Society for the past and ensuing years.

On motion of Doctors Withrow and Girdwood the Council's report was ordered to be considered forthwith.

Dr. Johnson pointed out an error in printed Proceedings for 1890, XLV., at foot of page. The two sentences ought to form only one paragraph, so as to show that they are only one clause. The statement at the top of the page, where there is an error in printing, also shows this. When papers are printed which were not written by Fellows, they should have this indicated by the word "communicated" if in English, and "*présenté par*" if in French.

Reports of Affiliated Societies.

The Acting Secretary again read the list of affiliated societies and the following reports were submitted by their respective delegates:—

I.—From *The Nova Scotia Historical Society, Halifax, N.S.*, through Mr. F. Blake Crofton.

The following papers were read before the Society during the season 1890-91:—

Date.		Title of Paper.	Author.
1890.	Nov. 18	Early Reminiscences of Halifax (*continued*)	Peter Lynch, Q.C.
	Dec. 9	Historical Note on John Crowne	Prof. A. McMeehan, Ph.D.
1891.	Jan. 15	Richard John Uniacke	Hon. L. G. Power (Senator),
	Jan. 20	The Portuguese on the northeast coast of North America (part 1)	Geo. Patterson, D.D., F.R.S.C.
	Feb. 10	Do. (part 2)	Do.
	March 10	Facts and Enquiries Concerning the Early History of Agriculture in Nova Scotia	Geo. Lawson, LL.D., F.R.S.C., etc.

The society has suffered an irreparable loss in the death of Dr. T. B. Akins on the 6th of this month. A short account of his life and work will appear in the seventh volume of the Society's 'Transactions,' which is now in press. His valuable and unique collection of books and pamphlets connected with British North America has been generously bequeathed to the Society.

II.—From *The New Brunswick Natural History Society, St. John, N.B.*, through Mr. G. U. Hay.

I have the honour to communicate, as the delegate of the New Brunswick Natural History Society, the following report:—

During the past year, by the closing of the affairs of the St. John Mechanics' Institute, its large collection of natural history objects and antiquities have come into possession, by purchase, of this Society. This addition to the Society's museum gives it a much greater value, especially from a historical point of view, as the museum recently acquired embraces collections made by Dr. Gesner, who was appointed by the Government of New Brunswick to make a geological survey of the Province at a time when geology was in its infancy. This was the first survey undertaken by any Province in Canada, or, perhaps, by any British colony.

The following papers have been communicated to the Society during the past year:—

Geology, with experiments, by G. F. Matthew, M.A.
Economical Mollusca of Acadia, W. F. Ganong, M.A.
Notes on the Watershed between New Brunswick and Quebec, L. W. Bailey, Ph.D.
Notes on Plant Life, with experiments, G. U. Hay, Ph.B.
A Sketch of the Life of the Late Prof. Ch. Fred. Hartt, G. F. Matthew, M.A.
India Rubber and its Uses in the Arts, Jas. A. Estey.
The Growth of our Knowledge of the Invertebrates of Acadia and Newfoundland, W. F. Ganong, M.A.

In addition to the regular meetings, classes have been formed and elementary instruction given in geology and botany, chiefly to the public school teachers of the city and other students in natural science.

I am pleased to report considerable interest in the biological section of the Society. The researches of Mr. W. F. Ganong in marine Invertebrates on the coast of the Bay of Fundy have brought to light many rare and interesting forms, and considerable additions have been made to the Museum of Invertebrate Zoology. Since the publication of the Rev. Prof. Fowler's list of plants in 1887 some forty or fifty species of plants new to the province have been added to the flora.

In the "upper series" of the Laurentian limestone near St. John, Mr. Wm. Murdoch, C.E., has discovered fossil remains of coral-like structures somewhat like certain forms found in the basal beds of the Cambrian. A minute examination by Mr. G. F. Matthew has revealed the fact that the fossil remains are of animal origin and may be allied to Eozoön. The provisional name of Archæozoon Acadiense has been attached to the discovery. A large fragment of the limestone, weighing about half a ton, has been placed in the museum at St. John. The flat surface of the rock presents the appearance of closely compressed layers of petrified wood.

On the whole, I am able to report a much greater efficiency in our society, by additions to its museum and in other directions. Should the Royal Society in its wanderings come to St. John in the near future, I am assured that the many features of interest, both to the geologist and the historian of that locality, would be appreciated by its members, while its influence would give an impetus to the objects which the Natural History Society of New Brunswick seeks to encourage.

III.—From *The Ottawa Literary and Scientific Society*, through Mr. H. B. Small.

In presenting to your honourable body a report of the proceedings of the Ottawa Literary and Scientific Society for 1890 it affords me very great pleasure to state that, at its annual meeting, last month, the affairs of this society were shown, from the reports of the officers of its respective branches, to be in a more satisfactory condition than for some years past, and the great care taken during the past year to limit the expenditure to the lowest possible amount, compatible with its efficiency, has succeeded in placing the society in a position which it is hoped will tend to increase its popularity and extend its usefulness.

The ordinary funds at its disposal allowed of very little outlay for the purchase of new works for the library, and to meet this difficulty the president personally obtained from several friends donations amounting to $100 for library purposes, by means of which a number of books have been added to its shelves, and this increase has proved very serviceable.

The total number of books now belonging to the library is 2,578, and the demand during the past year exceeded its predecessor by 430 volumes.

A fair percentage of use marked during the year the various branches of scientific works and books for reference, but, as seems to be the case in all libraries, fiction heads the list. In this case, however, I can state that the majority of the books of this class are of the higher order, light or trashy publications not being purchased. The encyclopædias on our shelves are constantly consulted, and the bound copies of magazines appear to be in continual demand by readers searching for subjects in which they are interested. The majority of magazines taken are ultimately bound, and in course of time our library will be rich in periodical literature.

The absence of a public library enhances the value of our society's collection, especially as that of Parliament is not accessible to everyone, and a library is now a necessity for our citizen population.

It is acknowledged on all sides that our society is really filling the want supplied in other large cities, viz., that of a public library, and it is duly appreciated as such, as well as being a public literary institution for all classes.

The reading-room, containing the leading papers and magazines, has been well patronized and seems to grow in popularity as time goes on.

The lecture course during the past winter was one of the most successful in the annals of the society. The meetings were all held in the society's rooms, and, without exception, were well attended. The course was as follows:—

1890. Oct. 22—"British, Boer and Black," by Rev. Principal Grant, D.D., F.R.S.C.
Nov. 6—"Slavery in Canada," by Benj. Sulte, Esq., F.R.S.C.
Nov. 20—"Dominion of Mind," by Rev. E. B. Ryckman, D.D.
Dec. 4—"Mountain Ranges and Great Rivers of the Pacific Coast," by Prof. John Macoun, F.R.S.C.
Dec. 18—"Chest Development," by B. W. F. Hurdman, Esq., M.D.
1891. Jan. 8—"Science of Politics," by W. D. LeSueur, Esq., B.A.
Feb. 5—"Human Hair," by A. J. Horsey, Esq., M.D.
Feb. 19—"Two Canadian Poets," by A. Lampman, Esq., B.A.
Mar. 12—"Haldimand," by W. Kingsford, Esq., C.E., F.R.S.C.

The desirability of obtaining new quarters for our society is more apparent than ever, but, single-handed, our limited income precludes the accomplishment of our design.

We hope that your honourable body will, during your present session, arrive at some conclusion respecting a permanent repository for your accumulated exchanges and volumes, together with their custodianship. In this connection I would say that our society has in view a large and commodious new building at the capital, consisting of three flats, admirably adapted for the purpose indicated, and for our society's use, and should you coincide in the proposal submitted by letter to your secretary, our custodian could act also in the same capacity for you free of charge.

Your decision, at the last annual meeting in Ottawa, to establish your headquarters permanently at the capital, has given strength to the proposal made to your Committee, appointed at that meeting, and we hope that a final decision may be arrived at during your present meeting which may be beneficial to all concerned.

The public schools having, during the winter, held night classes, and the evening technical instruction given at the Art School, militated against the efforts of our society in that direction. Indeed, so numerous are the attractions now offered by church associations and other social literary amusements, that it is a source of gratification to have had so large an attendance at our regular evening lectures as I have been able to report.

The Field-Naturalists' Club, the majority of whose members belong to our society, make a special report to you. With their labours and ours combined, Ottawa possesses a class of workers in literature and science whose researches ought greatly to aid the intellectual development of the Dominion.

At the Annual Meeting for the election of officers for 1891 Mr. H. B. Small, who filled the office of President for the last three years, declined renomination, and Mr. Robert Gill, Manager of the Bank of Commerce, was unanimously elected, with Messrs. W. D. LeSueur and Jeffrey Burland Vice-Presidents.

IV. From the *Entomological Society of Ontario*, through the Rev. Thomas W. Fyles, F.L.S.

Canadian Entomology is the outgrowth of the last thirty years, and in its development the Entomological Society of Ontario has played no unimportant part. The first movement towards the formation of this society was made in 1862; and at that time, according to the statement of the

naturalist Grote (19th Report of the Entomological Society of Ontario, p. 62), there were probably not one hundred species of Lepidoptera named and determined in any collection on this continent The society was fully organized on the 16th of April, 1863. In August of 1868 it commenced the publication of its monthly organ, the 'Canadian Entomologist,' which ante-dated by one month the 'American Entomologist,' edited by Walsh and Riley. In 1871 the society was duly incorporated; and since then, under the fostering care of the Ontario government, it has maintained its important position as one of the leading entomological societies on the continent of America.

One of the conditions of the act for its incorporation was that it should present to the Commissioner of Agriculture for Ontario an annual report of its proceedings. Twenty-one such reports have now been issued, the whole embodying a vast amount of valuable entomological information.

The report for 1890 contains an account of the proceedings at the annual meeting of the society, the address of the president, and the various reports and papers read on that occasion. It contains also full and interesting notes of the proceedings at the Indianapolis meeting of the Entomological Club of the American Association for the Advancement of Science, and of the American Association of Economic Entomologists held at Champaign, Illinois. These notes were presented by Mr. Fletcher, who had attended the meetings of the association as the society's representative. They are followed in the 'Report' by various original papers, thought to be of interest both to entomologists and to the general public. The titles of these are: "Kitchen Garden Pests and How to Deal with Them;" "An Outbreak of the Army Worm in Maryland;" "Tortoise Beetles;" "Quebec Representatives of the Genus *Plusia*;" "Origin and Perpetuation of Arctic Forms;" "Fuller's Rose-Beetle;" "Hymenoptera Parasitica;" "Insects Injurious to the Elm;" "The Entomology of Shakespeare;" and "Experiments for the Destruction of Chinch Bugs." The rest of the 'Report' is made up with selections, and notices and critiques of the most important entomological publications that had appeared in the course of the year.

The 'Canadian Entomologist' has reached its twenty-third volume. It is still under the able management of the Rev. Dr. Bethune, F.L.S. It has now been permanently enlarged to twenty-four pages, and "continues to receive contributions from all the most eminent entomologists in North America, and to circulate in all parts of the world." (21st report, introductory letter from the secretary to the Honourable the Minister of Agriculture). In the volume for 1890 articles appear from thirty-five contributors who are pursuing their investigations in various parts of British North America, the United States of America, Great Britain, British India and Germany. No less than seventeen new species of insects are described in its pages.

The constitution of the society provides for the formation of branch associations; and in Montreal an important branch has flourished for a length of time. It was chiefly through the instrumentality of Mr. F. B. Caulfield that this branch was called into existence, and it still enjoys the benefit of his services as vice-president. Under the presidency of Mr. H. H. Lyman it is raising up a number of young and enthusiastic entomologists, who give promise of attaining eminence in their favourite pursuit. At its monthly meetings original papers have been read, and descriptions of several new species of beetles, discovered by Mr. J. F. Hausen, one of its members, have been given. The secretary of the branch is Mr. A. F. Winn.

The scheme for the formation of sections, which was put into operation last May, continues to work admirably. The sections formed in London, the headquarters of the society, are four—the Botanical, the Ornithological, the Geological and the Microscopical, all of which are doing good work. The value of all these sections to the parent society will be readily perceived: of the Botanical, in determining the food-plants of insects and in tracing insect ravages and their results; of the Ornithological, in discovering what insectivorous birds act as checks upon particular kinds of insects and in answering such inquiries as that which called forth a volume from the United States Agricultural Department, (whether the English sparrow, which was said to destroy large numbers of injurious larvæ, was of benefit to the community or not); of the Geological, in shewing what kinds of soil are

favourable to the growth of certain plants, and thus indicating the localities for particular insects, and also in tracing the impressions left by extinct species in various geological formations; and the Microscopical, in noting the structural peculiarities of insects, and in aiding to classify minute forms.

The Botanical section numbers sixteen members. Its chairman is Mr. J. Dearness; vice-chairman, Professor Bowman; and secretary, Dr. S. Carson. Meetings for study and mutual assistance are held every Saturday evening from the 1st of May to the 1st of October. A number of excursions have been carried out, and some new species added to the already well-examined flora of the environs of London. Two new mosses have been discovered by Mr. Dearness, and a surprisingly large number of new fungi—more than sixty now named, and some yet unnamed. These fungi are for the most part new, not to Canada only, but to the whole of America.

The Ornithological section also is flourishing. It is engaged in gathering up facts of general import to ornithology, and is about to commence a systematic list of the breeding birds of Middlesex county, to be presented at the next annual meeting of the society. Its chairman is Mr. Wm. Saunders, and its secretary Mr. N. O. Balkwill.

The Geological section has nine members, Dr. S. Wolverton being chairman, Mr. T. Green vice-chairman, and Mr. J. L. Goodburne secretary. The members have made regular weekly excursions, and the district around London has been well worked up by them, and numerous interesting fossils have been added to the society's collections. Taken altogether, the year's work done by this section has been very satisfactory; the interest of the members has not flagged at any time, but each has seemed anxious to do what he could towards adding to the general stock of information.

The Microscopical section also has been active. It numbers twelve members, and it has in use eleven first-class microscopes. Ten meetings have been held by the members for private study, and two public entertainments for the benefit of the young people of the city have been given. Special attention has been paid by this section to fungi, mildews upon fruit-trees, rust in wheat, etc. Mr. John M. Denton is chairman of the section, and Professors Bowman and Dearness microscopical directors.

It is generally conceded that the formation of these sections was a happy procedure that strengthened the society and increased its usefulness.

At the last annual meeting the society secured the services of Mr. J. Alston Moffat, one of its members, who engaged to take entire charge of the society's rooms, library and collections, and to be a permanent resident official in London. It is felt that the greatest care will be taken by Mr. Moffat for the preservation and arrangement of the society's valuable collections of insects. These have lately been enlarged by the purchase from Mr. Johnson Pettit, of Grimsby, of several well-filled and well-arranged cabinets of Coleoptera, etc., the results of many years' intelligent labour on the part of Mr. Pettit.

Amongst the tokens of public recognition of the value of its collections the society preserves the medals and diplomas awarded it at the Centennial Exhibition in 1876, the International Fisheries Exhibition in 1883, and the Colonial and Indian Exhibition in 1886.

The library of the society now numbers 1,100 volumes. Amongst them are such costly works as the "Challenger" Reports, 20 vols.; Smith's Collection of Abbot's Illustrations, 2 vols., 1797; Drury's Exotic Entomology, 3 vols.; Stephen's Entomology, 8 vols.; Kirby's Entomology, 4 vols.; Say's Entomolgy, 2 vols.; Edward's Butterflies of North America, 2 vols.; Scudder's Butterflies of New England, 3 vols.; McCook's American Spiders, 2 vols.; Packard's Monograph of the Geometrid Moths; Lord Walsingham's Illustrations of Typical North American Tortricidæ, 2 vols.; The American Naturalist, 20 vols.; Scudder's Fossil Insects, 2 vols., etc. It is continually enriched by the printed reports and periodicals from the principal entomological societies of Great Britain, Australia, Austria, France, Germany, India, Italy, Russia, Switzerland, South America and the United States of America.

The society's collections, library, electrotypes, etc., are insured for $3,500.

The society reports, through its president, the unwelcome re-appearance of the Hessian fly (*Cecidomyia destructor*, Say), and recapitulates the best methods of dealing with the pest.

Another intruder that has been brought under the notice of the society is the Grain aphis (*Siphonophora avenæ*, Fab.), which has appeared in many localities in Ontario.

The Larch saw-fly (*Nematus Erichsonii*), after doing incalculable harm to the tamarac forests of Canada, is now diminishing in numbers. A new importation allied to this, the Willow saw-fly (*Nematus pallidiventris*, Fallen), has made its appearance on willows brought from Russia by the late Mr. Charles Gibb.

The Mediterranean flour moth (*Ephestria kuhniella*, Zellar), whose appearance in 1888 in a large milling establishment in Ontario caused so much consternation and called forth such vigorous action on the part of the Ontario Agricultural Department, seems happily to have been stamped out.

In these days of rapid transit and intercourse with foreign countries, the advent of new insect pests may be looked for. According to a wise provision, the directors of the society must be representatives from the different agricultural sections of Ontario. By this arrangement it is hoped the appearance and operations of injurious insects in any part of Ontario will be speedily made known to the society and receive careful attention.

The society has noted with the greatest satisfaction the valuable work done by Mr. Fletcher, the Dominion entomologist at Ottawa, who, by his entomological publications and his public addresses in various parts of the country, is diffusing knowledge that will be of the utmost importance to the community. The president of the society has truly said that "the result of his work must in course of time be the saving of hundreds of thousands of dollars to the farmers and fruit-growers of the Dominion." (President's address, 21st An. Rep., p. 10.)

The following is a list of the society's officers for the present year:—

President—Rev. C. J. S. Bethune, M.A., D.C.L., Port Hope.
Vice-President—James Fletcher, F.R.S.C., Ottawa.
Secretary—W. E. Saunders, London.
Treasurer—J. M. Denton, London.
Directors—Division 1—W. H. Harrington, Ottawa.
Division 2—J. D. Evans, Sudbury.
Division 3—Gamble Geddes, Toronto.
Division 4—A. W. Hanham, Hamilton.
Division 5—J. A. Moffat, London.
Librarian and Curator—J. A. Moffat, London.
Editor of the 'Canadian Entomologist"—Rev. Dr. Bethune, Port Hope.
Editing Committee—W. E. Saunders, London; H. H. Lyman, Montreal; Rev. T. W. Fyles, South Quebec.
Delegate to the Royal Society of Canada—Rev. T. W. Fyles.
Auditors—J. H. Bowman, H. P. Brock, London.

V.—From the *Institut Canadien-Français d'Ottawa*, through Mr. Napoléon Champagne.

J'ai l'honneur de vous soumettre le rapport des opérations de l'Institut canadien-français d'Ottawa.

Cette année, bien que nous n'ayons pas donné autant de séances littéraires que l'année dernière, nous sommes heureux de dire qu'au point de vue financier, nous avons obtenu un résultat des plus satisfaisants. Comme vous avez dû le constater par les précédents rapports, soumis à votre distinguée société, nous avons eu depuis quelques années à surmonter des difficultés nombreuses et sans cesse

renaissantes. Heureusement que des hommes énergiques ont été portés à la tête de notre chère institution pour lui rendre sa vigueur ancienne et pour lui conserver tout à la fois son caractère intellectuel et national.

J'aime à appuyer sur ce fait : nous sommes entrés dans une ère de véritable résurrection. La lutte ardente qu'il nous a fallu livrer pour conserver notre existence diminue d'intensité, et j'ose croire qu'avec une dernière poussée vigoureuse, notre stabilité matérielle sera définitivement fixée.

L'Institut canadien-français d'Ottawa, tout en ayant des liens d'indiscutable parenté avec les institutions du même genre de la province de Québec, a pourtant une physionomie, un caractère qui lui sont tout à fait particuliers. Ce n'est pas ici, dans cette province de Quebec, qu'il faut travailler ardûment à propager la langue française, à conserver ce premier rang universellement accordé aux races latines. Mais c'est plutôt dans Ontario qu'il faut que nos sociétés littéraires réagissent contre les altérations de notre langue et de notre tempérament.

L'Institut canadien-français d'Ottawa est la seule création de cette nature dans toute la province d'Ontario ; et comme la capitale compte dans ses limites une douzaine de mille Canadiens-français, il est facile pour vous de constater que notre tâche ne saurait s'accomplir qu'au prix d'un travail énergique et incessant.

Il pourrait peut-être paraître singulier, devant un auditoire composé de différentes nationalités, de m'entendre faire l'éloge d'une société qui ne compte dans son sein que des membres d'une même origine nationale. Mais je me rassure en songeant que les sciences et les lettres sont cosmopolites, et que toute œuvre portant l'empreinte du génie prend un aspect d'universalité et captive l'admiration et le suffrage de toutes les véritables intelligences. Les lauriers intellectuels, qu'ils soient portés par l'auteur de *Macbeth* ou l'auteur de *Cinna*, étalent toujours un glorieux épanouissement.

Cette année notre bibliothèque a été fréquentée par les membres de l'Institut beaucoup plus que d'habitude. Nous devons surtout faire remarquer que le goût des jeunes gens se porte de plus en plus vers des questions sérieuses. Bien entendu, nous n'avons pas à notre disposition, les derniers romans à la mode ; et c'est sans doute pour cette raison que nos lecteurs se voient dans la nécessité de lire des auteurs, sinon aussi agréables, du moins beaucoup plus utiles.

Nous avons, de plus, étendu nos relations, et fait beaucoup d'échange, avec les associations littéraires des pays étrangers. Nous retirons un bénéfice précieux de toutes ces communications, à cause de l'importance et de la grande valeur des volumes reçus.

Nos conférences d'hiver ont plus que jamais été goûtées et encouragées. Nous avons adopté une manière nouvelle de conduire nos séances littéraires. Nous donnons une conférence sur un sujet intéressant, et de plus nous joignons une lecture au programme. Cette lecture est ordinairement une monographie ou une page choisie de quelque écrivain français remarquable, et bien souvent nous avons extrait nos lectures des œuvres de nos auteurs canadiens-français, qui, eux aussi, ont leurs beautés.

Je crois qu'une énumération des sujets traités, ainsi que du nom des conférenciers, ne serait pas tout à fait hors de propos. Avec votre permission, je vais vous exposer brièvement ces quelques détails :

1°	Iberville - - - - - - - - -	M. l'abbé P. Langevin.
2°	Hypnotisme - - - - - - - -	M. le Dr F.-X. Valade.
3°	Recherches sur les postes anciennes - - -	M. Chs Bérard.
4°	La jeunesse de Napoléon Ier - - - -	M. Benjamin Sulte.
5°	Suite de la jeunesse de Napoléon Ier - - -	M. Benjamin Sulte.
6°	Bourreaux et martyrs de la Révolution - -	M. l'abbé P. Filiatrault.
7°	Les supplices terribles - - - - - -	M. Napoléon Champagne.

Ce soir, aura lieu à Ottawa la conférence de clôture, donnée par M. l'abbé P. Gaffre, sur les maquis et les vendettas Corses.

Soyez persuadés, Messieurs, que nous ne nous ralentirons pas un instant dans la poursuite de la

belle et louable mission que les fondateurs de l'Institut ont légué à leurs successeurs : celle d'instruire le peuple autant que possible, d'une manière tout à la fois profitable et agréable. En dernier lieu, je tiens à signaler que nous comptons, parmi nos membres, tous les hommes distingués d'Ottawa qui font partie de la Société royale : MM. Sulte, Lusignan, Marmette, De Celles, Tanguay, Deville, ainsi que M. Tassé, que nous réclamons encore comme un des nôtres. Depuis assez longtemps, Québec s'est fièrement décerné le titre de l'Athènes du Canada français. Que la vieille cité de Champlain porte son sceptre sans ostentation, car avec des plumes comme celles que nous possédons, s'il survenait un combat de chroniques et de sonnets, Ottawa pourrait dire avec Sertorius :

Rome n'est plus dans Rome, elle tombe où je suis.

VI. From the *Ottawa Field Naturalists' Club*, through Dr. Ells.

I have the honour to present herewith the report of the Ottawa Field Naturalists' Club for the year ending March, 1891.

The progress of the club during the past year has been eminently satisfactory. The membership has largely increased, no less than sixty-six new names having been added to the roll. The several lecture courses have been much more largely attended than in any previous year, and a generally increasing interest has been manifested in the work of the club. In addition to the two courses of lectures conducted by the club as a regular part of its operations a new departure was made during the past winter in the direction of a series of visits to the museum of the Geological Survey, on which occasions the different branches of natural history there displayed were discussed by the various officers of the Survey staff, and much valuable information was imparted in that way. The special object of these visits to the museum was to show the great value which might be derived from this institution in the study of the natural sciences. In the three series of lecture—viz., those in the afternoon, in the evening and at the museum—no less than twenty-six were delivered, embracing the several subjects of mineralogy, ornithology, botany, palæontology, geology, ethnology, etc.

It may be remarked that the condition of the club, both financially and otherwise, has never been more prosperous than at present. Its publications, now issued monthly, form an annual volume of over 250 pages. It has on its list of exchanges over seventy societies in Europe and America, and has a membership of nearly 300 persons, including many names distinguished for scientific work in various departments in all the provinces from the Atlantic to the Pacific, and one of the aims of the society now is to so extend its active membership as to make it the centre for collecting facts in all the branches of natural history from all parts of the Dominion.

The following list of officers for the present year was elected at the annual meeting in March :

President—Dr. R. W. Ells.
First Vice-President—T. J. MacLaughlin.
Second Vice-President—H. M. Ami.
Secretary—W. H. Harrington.
Treasurer—A. G. Kingston.
Librarian—W. A. D. Lees.
Members of Council—Miss M. A. Mills, Miss E. Bolton, Miss G. Harmer ; Messrs. W. Scott, R. B. Whyte and James Fletcher.

The leaders of the different sections for the present year are—in

Geology and Mineralogy—Messrs. H. M. Ami, W. F. Ferrier, and C. W. Willimott.
Botany—Messrs. James Fletcher, Wm. Scott and R. H. Cowley.
Conchology—F. R. Latchford.

Entomology—T. J. MacLaughlin, W. H. Harrington and James Fletcher.
Ornithology—A. G. Kingston, W. A. D. Lees and Prof. J. Macoun.
Zoology—J. Ballantyne, H. B. Small and W. P. Lett.

The publication of the 'Naturalist' is under the direction of Mr. James Fletcher, assisted by Messrs. Harrington, Kingston and Lees.

The lecturers in the several courses of the past year were as follows:

Evening course:

President's Inaugural Address.....Dr. R. W. Ells.
Science as an Aid to General Education.....Dr. J. A. MacCabe.
The Chimney Swift.....Mr. Kingston.
Canadian Gems.....Mr. Willimott.
The Development of Cultivated Fruits from Wild Varieties.....Mr. John Craig.
The Geology of Ottawa and Vicinity.....Mr. Ami.
Asbestos, its History, Mode of Occurrence and Use.....Dr. Ells.
Mineral Phosphates.....Mr. Lavison-Wills.

The afternoon lectures embraced the following:

The Study of Natural History.....Miss M. A. Mills.
The Geographical Distribution of Plants.....Prof. Macoun.
The Educational Value of Botanical Gardens.....Mr. J. Fletcher.
The Physiology of Plants.....Mr. W. Scott.
The Migration of Birds.....Mr. Lees.
The True Bugs.....Mr. Harrington.
The Chemistry of Food (2).....Mr. Shutt.
Beneficent Birds.....Mr. Kingston.

The Saturday afternoon museum course was as follows:

Ornithology (two lectures).....Mr. Whiteaves.
Botany (two lectures).....Prof. Macoun.
Ethnology.....Dr. Dawson.
Geology and Palæontology (two lectures).....Mr. Whiteaves.
Mineralogy (two lectures).....Mr. Ferrier.

VII.—From *The Wentworth Historical Society*, through Mr. Geo. H. Mills.

As a delegate I have the honour to submit the following report:—

The Wentworth Historical Society was fully organized on the 15th January, 1889, when the following officers were elected:—

President—Geo. H. Mills.
First Vice-president—Hon. Arch. McKellar.
Second Vice-president—Major E. O'Reilly.
Executive Committee—F. M. Carpenter, M.P., Lyman Moore, H. C. Baker, Major Henry McLaren, F. W. Fearman, John Muir (Judge C. C.), J. W. Jones, LL.D., T. C. Mewburn, Richard Bull, T. H. Stinson, John A. Barr.
Secretary-treasurer—J. H. Land.

Constitution and By-Laws Adopted 7th February, 1891.

Objects of the Society.

1. To prosecute researches into the history and archæology of the Province of Ontario, and into the genealogy of the inhabitants thereof.

2. To publish the results of those researches so far as may be deemed advisable.

3. To collect and maintain a library of books, pamphlets and manuscripts, more especially such as relate to the history of the Province of Ontario.

4. To collect and preserve such archælogical and other specimens, relics and traditions as may tend to illustrate that history.

5. To record passing events with accuracy.

6. To create and perpetuate a closer and more friendly relationship between the early settlers of the country and their descendants.

Total membership, 179, of whom 51 are ladies.

Honorary Members.—Hon. G. W. Allen, D.C.L., President Historical Society of Ontario; Rev. H. Scadding, D.D., President York Pioneers; Rev. Canon Bull, M.A., President Lundy's Lane Historical Society; The Presidents of the Pioneer and Historical Societies of Lethbridge and McLeod; Miles O'Reilly, Q.C.; Very Rev. J. Gamble Geddes, D.D., Dean of Niagara; Robert Jarvis Hamilton, Col. John Land, Peter S. Van Wagner and Mrs. John Rose Holden.

Twenty-nine regular and executive meetings of the society have been held, and the following papers read—"The Battle of Stony Creek," by J. H. Land, Secretary; "Fifty-seven Years of Canadian Life," Major Glasgow; "Champlain, Father and Founder of Canada," Mrs. J. Rose Holden; "Canadian History," Senator Donald MacInnes; Inaugural Addresses by the President; Biographical Sketch, Dean Geddes.

On the 5th June, 1890, the society held a picnic on the Stony Creek battle grounds, which was attended by fully one thousand ladies and gentlemen, when the resolutions following were unanimously carried:—

Resolved,—That we regard with thankfulness the contentment, comfort and self-reliance of the people of this Dominion, which the freedom of our institutions and the bravery of our ancestors under Divine Providence have conferred upon us, and we gratefully acknowledge the moral and material support which in the past our Mother Country has ever willingly granted and secured to us in a great measure as the result of the glorious victory, the anniversary of which we now celebrate.

Resolved,—That the Dominion Government be respectfully requested to grant a reasonable sum of money in aid of the erection of suitable monuments on the battle ground of Stony Creek and on Burlington Heights, in commemoration of the heroic bravery and self-sacrifice of the defenders of our country, and in grateful appreciation of the important results which the victory attending that battle has secured to us.

Resolved,—That this meeting urge the importance of forming pioneer and historical societies throughout the Dominion as a valuable and influential agency for the collection and preservation of the necessary materials for reliable histories of our country, and as an indication of the loyalty of the Canadian people to their country and their attachment to British laws and institutions.

An extract from the proceedings of the above meeting is respectfully submitted along with this report.

In December last application was made to the council of the city of Hamilton for the purchase of a portion of the ground known as "Earthworks," constructed in 1813 on Burlington Heights, when the executive council of the association passed the following resolution:—

"*Whereas,* having learned with surprise and regret that the cemetery committee of the city

council are offering for sale a further portion of the grounds known as Burlington Heights Breastworks, to be used for private purposes at the very time when petitions are before Parliament praying for the erection thereon of a suitable memorial to commemorate the spot constructed in defence of the country, from whence a handful of brave men utterly routed an invading enemy, numerically four times their own strength, and preserved the whole of the southern part of Ontario; and believing that such action was taken without full knowledge of the historic value of those grounds, therefore resolved that this executive council of the Wentworth Historical Society solemnly protests against such action of the city council, and against any further encroachment upon those memorable grounds."

At a meeting of the city council subsequently held, a resolution was unanimously carried endorsing the views of the society and declaring that no further disposition of the grounds in question should be made.

Petitions from the society have been forwarded to the Federal Government praying for the erection of suitable memorials on the Stony Creek battle grounds and on Burlington Heights, and the society has fair reason for believing that the prayer of the petitions will be granted.

The society has in possession many specimens, relics, manuscripts and biographies, altogether forming a collection of considerable value.

The membership of the society was materially augmented last autumn by the admission of ladies to its councils, who, with Mrs. Isaac Buchanan as their vice-president, form an influential auxiliary adjunct of usefulness in promoting the objects of the association.

In conclusion, the society desires gratefully to acknowledge receipt of the 'Proceedings and Transactions of the Royal Society of Canada,' since its formation, consisting of five neatly bound volumes.

Extract from the inaugural address of the president, Mr. Geo. H. Mills, at the opening meeting for the season of 1890-91, Tuesday evening, Nov. 18, 1890:

I may say at the outset that the inception of all associations with objects and aspirations similar to ours, has been the legitimate offspring of what may be properly designated "patriotic sentiment." That where these associations have proved successful the spread of this sentiment has been the chief cause of success, and where they have ended in failure, a decline of that sentiment has been apparent. Assuming this to be substantially true, it may be asked: "What, then, is patriotism?" Our language thus defines it: "Love of one's country, the passion which aims to serve one's country, either by defending it from invasion or protecting its rights, and maintaining its laws and institutions in vigour and purity; patriotism is the characteristic of a good citizen, the noblest passion that animates a man in the character of a citizen." Pioneer and historical societies formed and fighting under such a banner can be no discredit to any country. They know no party, they simply love their country.

The influence of such associations ought to promote manhood, furnish strength to the arm raised in defence of right, and paralyze the designs of traitors. Nations draw their stability from the patriotism of their subjects. It is, indeed, the keystone to the arch of national construction, and in a free country the greatest safeguard to liberty, independence and progress, its decline a prelude to national degeneracy, its spread an indication of national vigour. Without patriotism, Canada, with all her wealth of resource and her almost boundless territory, may never hope to become an independent nationality. With it that destiny would seem to be inevitable.

* * * * * *

If what I have stated be true, or even faintly approaching the truth, why should popular patriotic histories of this grand Dominion not be encouraged? Why should our common schools and our universities be comparatively destitute of them? Why should full knowledge of this priceless inheritance, manfully acquired and heroically defended by our forefathers, be withheld from their children? Why, in a word, should Canadian history take any but a foremost place in all our educational institutions?

There can be no rational answer to negative the demand. It is, indeed, gratifying to have observed, during the past two years, the increasing interest taken in the demand for a larger representation of Canadian literature in our schools, as indicated by letters and leading articles in our newspapers, and it may not be speaking beyond the fact to say that the historical and pioneer societies throughout the Dominion—becoming daily more influential—have had something to do with the existing popularity of the subject. The good work in this direction already accomplished by the Pioneer and Historical Society in Toronto, so ably presided over by the venerable Dr. Scadding, and the Lundy's Lane Association, with its energetic president, Canon Bull, entitles these organizations to the highest regards of thoughtful and cultivated men.

If I have rightly understood their motives, the many historical societies throughout the Dominion have a common object, and that is to assist with all the power of their influence in laying broad and deep the foundations upon which the future of this larger part of the continent may assuredly and safely rest, and this they believe may be attained by encouraging patriotic sentiment. United, their efforts will certainly be crowned with success; separated, the result may be doubtful. I am, therefore, impressed that no time should be lost in calling a convention of delegates from all of these associations, and that such convention shall arrange for a united membership, and adopt rules to direct and govern the entire combination. Such a confederation would attract to itself enlarged membership and enhanced resources, sufficient to enable it to propagate its principles and extend its influence to the utmost borders of the Dominion.

In conclusion I may say that the rugged manhood of Canada has so far overcome every obstacle in the way of progress, from the first French colonies planted in Quebec only to be decimated by starvation and the rigour of the climate, to the war of 1812-14, when the total population of the two provinces, barely reaching 275,000, successfully resisted the invasion of a nation at the time possessing a population of 8,000,000. In no boastful spirit should all this be remembered, but still it should be remembered.

To-day we are in the full enjoyment of peace, plenty and prosperity, governed and protected by laws and institutions unsurpassed for their purity, equity and intelligence. Let us do our best to transmit these blessings to those who come after us, and we will have accomplished a work that we shall never be ashamed of.

VIII.—From *The Hamilton Association for the Promotion of Science, Literature and Art,* through Mr. T. McIlwraith.

The session just closed has been a successful one, whether the work done, the papers read, or the attendance of members be considered. No less than forty-six new members have been added to the roll, the number of *bona fide* members being now 156.

During the year seven general meetings have been held, at which the following papers have been read and discussed:—

"The Early History of Hamilton and its Neighbourhood," by the President, B. E. Charlton.

"The Surface Geology of the County of Lincoln and Neighbouring Counties," by D. F. H. Wilkins, B.A.

"Egypt with an Account of the Book of the Dead," illustrated by the British Museum *fac simile* of the Papyrus of Ani, written at the close of the fourteenth century, B.C.

"Connecting Links," by H. B. Small.

"Flutes of the Time of Moses," by J. E. P. Aldous, B.A., and Biological Notes, by William Yates

"Electricity as a Source of Light and Heat," with experiments, by J. T. Crawford, B.A.

"Botanical Jottings," by A. Alexander.

At the annual meeting, held on May 14th, the following officers were elected for the ensuing session, viz.:—

President—A. Alexander, F. S. Sc.
First Vice-president—A. T. Neil.
Second Vice-president—Samuel Briggs.
Recording Secretary—A. W. Stratton, B.A.
Corresponding Secretary—Thomas Morris.
Treasurer—Richard Bull.
Curator—Alexander Gaviller.
Council—William Turnbull, W. A. Robinson, Col. Grant and Dr. Reynolds.

The Geological Section has met every month and papers on several important geological subjects have been read, such as "Stromatoporidae," by A. E. Walker. Colonel Grant, the chairman of the section, has looked after the interests of the section and read several papers, among others one on "Burlington Heights," in which he called attention to the finding of sub-fossil remains of rodents and sand snails; another on the "Cœlenterata," and also a paper on the "Asteroidea," besides a series on the Irish Celts and their relics.

Very great interest has been manifested in the new section for Philology, and the following papers have been read:—

"The Life and Work of F. Bopp," by H. P. Bonny.
"The Home of the early Aryans," by Chas. Robertson, M.A.
"A Re-statement of Grimm's Law," by A. W. Stratton, B.A.
"The Origin of Languages," by Dr. H. Birkenthal.
"The Development of the French Language," by W. H. Schofield, B.A.
"Anglicisms in Lower Canadian French," by H. P. Bonny.

In Biology, the subjects of Ornithology, Botany and Conchology have received attention. In the latter department considerable additions have been made by Geo. M. Leslie and A. W. Hanham to the Canadian list of shells.

The list of those found since the last report is appended, as also the Treasurer's report.

All of which is respectfully submitted.

Abstract of Report of Biological Section.

List of shells added to the Hamilton list since last report:—

Zonites multidentatus, Binney.
" ferrus, Morse.
" Binneyanus, Morse.
Helix pulchella var. costata.
Limnæa columella (?)
Limnæa reflcta.
Limnæa, two specimens taken likely to prove new to the Canadian list.
The taking of Helix pulchella is the first time it has been collected in Canada.

Besides the finding of these new species our Limaxes have been identified as:—

Limax agrestris, Linn.
Limax campestris, Binney.
Zebennophorus Carolinensis, Bose.
Zonites suppresus, Say.

Several dead shells of an Amnecolla have been found which are considered by Mr. Pilsbury to be a new species.

The Hamilton list now numbers 98 species; of these 46 are terrestrial and the balance, 52, are fresh water mollusca.

GEO. M. LESLIE.

Treasurer's statement for year ending 14th May, 1891:—

Income.		*Expenditure.*	
Balance from last year	$276 74	Rent	$165 00
Government grant	400 00	Gas	12 55
Members' subscriptions	160 00	Printing	174 30
		Stationery and postages	42 30
		Insurance	11 88
		Commissions and caretaking	24 80
		Removing museum specimens and incidentals	62 85
			$493 68
		Balance in Bank	343 06
Total	$836 74		$836 74

H. P. BONNY, A. T. NEIL,
Auditors.

RICHARD BULL,
Treasurer.

14th May, 1891.

The society then adjourned.

At 3 o'clock His Excellency the Governor-General arrived, and was received by Principal Grant on behalf of the society, and by Sir Donald Smith on behalf of the Citizens' Committee. Having shaken hands with those present, he visited in turn each of the sections, and evinced much interest in the papers which were being read.

THE EVENING MEETING.

In the evening a public meeting was held in the Queen's Hall. His Excellency Lord Stanley of Preston, honorary president of the society, was present. Among others on the platform were Sir Donald Smith, fellows and delegates, and prominent visitors from the United States.

After the reading of Lord Lorne's letter, which appears elsewhere in the minutes of the 'Proceedings,' the president, Very Rev. Principal Grant, delivered the annual address.

THE PRESIDENT'S ADDRESS.

On December 29th and 30th, 1881, a few gentlemen, designated by His Excellency the Marquis of Lorne, the Governor-General of Canada, met in Montreal and considered a memorandum from His Excellency relating to the formation of an institute, academy or society for the promotion of literature and science in the Dominion. They agreed to suggest a provisional basis for the constitution of such a society, substantially the one that was subsequently adopted. The title suggested was "The Royal Society of Canada for the Promotion of Literature and Science within the Dominion." The

members were to be persons who had published original works or memoirs of merit, or had rendered eminent service to literature or science. The society was to consist of two departments, each subdivided into two sections, and the number of members in each section was limited to twenty. Ottawa was made the headquarters of the society, and at least one general meeting was to be held annually, "at such times and places as by by-law or otherwise might be determined." The original eighty members were nominated by His Excellency. In the following May the members met and formally inaugurated the society. Her Majesty gave it her gracious permission to assume the title of "The Royal Society of Canada." The Government and Parliament of the Dominion recognized it by bestowing an act of incorporation and by a gift of $5,000, which has been annually renewed, and which has enabled it to publish the transactions of the year in handsome volumes, with adequate illustrations.

Nine annual meetings in all have been held in Ottawa, and in now holding the tenth in Montreal, the place of the society's birth, it seems to me not unfitting that we should, in commercial phrase, "take stock;" and this, not for the purpose of praising ourselves for what has been done, but for enquiring how far the constitution of the society has proved well adapted to secure the objects originally contemplated, and how we can serve the State better in the future. Anyone who looks into the volumes of 'Proceedings and Transactions' already issued will see that there is no cause for discouragement. The results of the work of the society are there manifest. Had it not existed, many of the papers that are most interesting to Canada would not have been written. Others would have been scattered through the transactions and journals of two continents, labelled, of course, as British, French or American. Our bulky annual volume is now sent regularly to all the great public libraries of the world, and literary and scientific men learn that Canada is not wholly a barbarous country, but that it is giving some little contribution to learning. Far-seeing, practical men in other countries who desire reliable information respecting the geology, minerals, products, antiquities, history and institutions of Canada, now know where to find it. Everyone, I think, will agree with Prof. Lawson, in his address as vice-president of the society in 1887, that "thus far substantial and permanent service is rendered."

The society has been useful in another way. Far from superseding local or provincial societies, organized in whole or in part on the same lines, it has been to some extent a bond of union and a stimulus to them. Delegates from twenty or thirty of these societies report their proceedings to the annual meetings, coming to Ottawa to do so from as great distances as Halifax to the east and Winnipeg to the west. We have not interfered with their work, as was at one time feared, nor withdrawn any funds previously allocated to them. The Royal Society aimed at being essentially a Dominion institution. The only public body to which it looked for aid in prosecuting its work was the Dominion Parliament, and that body has fulfilled the expectation that was entertained regarding its probable attitude. Comparing the means at its disposal with those which Congress or the Imperial Parliament controls, it has generously sustained us. The State, therefore, has a right to ask whether the society is doing all that it can to serve the public, or whether any modifications in its constitution or practice would enable it to do its work better.

From the sketch that has been given of its history, it will be seen that the Royal Society is not, as it has sometimes been styled, a self-constituted body. We have been called into existence by the head of the State, and have been, substantially as well as formally, recognized by Parliament. At the same time we are free to make such changes as may be shown to be in any way more conducive to the good of the country. Lord Lansdowne's words to us express the conviction of every member: "The less you have to do with official interference, however well intentioned, in your affairs, the better for you. The form of government in the world of letters is republican, and that literary community will prosper most which depends least on external guidance and official recognition." Without the least desire to erect a close literary and scientific corporation, we think that we may serve as a bond of union between men of thought and letters in Canada, and even between widely separated

societies and universities. Some such bond is needed in a country of diverse languages and races, where common sentiments are only beginning to grow, where the population is widely scattered, and the centres of intellectual activity are far apart. It may be mentioned here that one of the objects specified in our act of incorporation is the offering of inducements for valuable papers on subjects relating to Canada, and to aid researches already begun and carried on so far as to render their ultimate value probable. The only action hitherto taken to carry out this object is enough to show that the desire of the society is not so much to magnify itself as to call attention to the needs of our universities. In 1883 a committee was appointed to report upon the forms of aid and encouragement given in other countries to young men deemed qualified and desirous to engage in original literary and scientific work, and to suggest the best means of providing similar aid for young men in Canada. The committee took a great deal of trouble and made exhaustive enquiries on the subject. It reported in 1885, and presented in tabular form a complete list of the aids offered in Great Britain and Ireland in the form of fellowships. One has only to glance at this list to see how varied and extensive is the provision made in the mother-country in this regard. Such endowments are also growing rapidly in the United States, but in Canada only a small beginning has been made, and our few fellowships are so conditioned that their holders, being required to engage in teaching, are unable to study abroad. After surveying all the sources from which aid might be given for those scholars who have proved their fitness to devote themselves to pure science or literature, the committee reported that Canadian fellowships must be expected from private benevolence, that apparently inexhaustible source which has never failed in Britain, and which is now flowing so freely in the States; and as the progress recently made by some of our universities warranted the hope that when the utility of fellowships was understood and their necessity perceived, the funds would be forthcoming to endow them, the society ordered a large number of separate copies of the report to be struck off and sent to the heads of Canadian universities, to be distributed by them to persons able and willing to assist in the work. I mention this not merely for the sake of showing, by this instance, that the society has not dreamed of constituting itself a literary or scientific monopoly, but also for the sake of expressing my own conviction that science or literature must be studied, not for immediate practical results, but for its own sake. The true practical man is surely he who can look furthest ahead and plan accordingly, with a view to permanent rather than immediate results.

It will not be out of place to repeat the warning of Sir Daniel Wilson in his presidential address: "It is impossible to neglect pure science, and yet hope to reach those results which are but its latest fruitage. . . . We can no more look to have the practical fruits of science without the preliminary labour of ardent search for abstract truth, than we can look for the reaping of the harvest where there has been no seed time." This is even more profoundly true in the case of literature. The men who interpret for us the age in which we live, who expand our range of thought and reveal to us new sources of beauty and power in human life, are not produced in the feverish struggle of commerce and politics. They grow only in deep soil, and they need favourable conditions for full and harmonious development. These conditions are best fulfilled when the general state of the people is satisfactory, and when the universities are equipped to meet the demands and opportunities of the time. Canadians are giving proof that they understand this, so far as their universities are concerned. Considering the stock from which they have sprung, it would be very strange if they did not, and the proofs are not confined to the two or three cities where our wealthy men chiefly reside. The general university extension that has taken place since Confederation is very remarkable for a new country. This is not the occasion to go into statistics, but I may say that it compares favourably with the increase in the general wealth and the development of our railroads, canals, mines, manufactures, commerce and agriculture. It has come, not from the generosity of a few millionaires, though the names of such will readily occur to any Montreal meeting, but from the self-sacrificing spirit of many of the graduates, and the faith that inspires the best of our people with a deep conviction of the value of learning. A people so inspired will in due time provide all that may be needed, travelling as well as

resident fellowships. Canadians, too, who have gone abroad do not forget the duty they owe to the dear natal soil. George Munro succeeded in business in New York that he might make Dalhousie College the intellectual lighthouse of Halifax. If this is considered a modern instance of spoiling the Egyptians, it will probably convince students of Dalhousie at any rate that there is something to be said for the action of the ancient Israelites that has often been considered indefensible.

I must, however, go on to consider the Royal Society itself. It is in reality a union of several academies, as Dr. Sterry Hunt pointed out, and for two of these, at any rate, it is scarcely necessary to say a word. Everyone recognizes the necessity of societies for encouraging scientific research. Whether these should consist of a small fixed number of members like the Royal Societies of London and Edinburgh, the Royal Irish Academy and the National Academy of Sciences in the United States, or whether they should be on the basis of the British Association for the Advancement of Science and throw the doors open to all interested in learning or its diffusion, is a matter on which different opinions may be held. But all agree that there are special reasons for the formation of scientific societies, and that whether constituted on the one basis or the other, they have vindicated their right to exist and to be generously supported. "The man of letters," pleads Dr. Sterry Hunt, "may hope to find in a publisher and a reading public encouragement and pecuniary recompense for his labour; but the student of science, though he may perchance gain fame, has little hope for such rewards. . . . He asks only for generous criticism and means of publication." It may be added that criticism from fellow-workers assembled in council is almost indispensable and that his paper when published will be read by only a limited circle. And yet few expenditures of public money are more profitable to the State than that which provides for the publication of scientific papers. There is, too, every reason why Canadian natural history should be organized in a strong society. Vast regions of our country, stretching from the lakes to the Arctic Ocean and from the Atlantic to the Pacific, are unexplored. These present important questions, that will take many years for solution in regard to geological structure, ore deposits, the floras and faunas of sea and shore, of land, lakes, prairies and mountains, and other matters connected with geography and natural history. The section that deals with mathematics, physics and chemistry cannot make this special Canadian claim. Those sciences belong to no one country. But at any rate our workers in those fields need the same stimulus and aid that is given elsewhere, and their reputation is dear to them and to us as Canadians.

But the Royal Society has a literary as well as a scientific side, and its literary side is also subdivided into two sections. In its case, however, the line of division is language and not subjects. At first sight this seems indefensible. Canada is one country, and for literature there can be only one language. Homer, the Hebrew prophets, Dante, Shakespeare, Molière, Goethe, used different tongues, but to the literary man they speak the same language. They have all entered into his life-blood, and he could no more separate what he owes to one from what he owes to another than he could separate the red from the white corpuscles of the blood that runs in his veins. It is the same with his debt to the great masters of his own day. Victor Hugo, Robert Browning and Tolstoï speak the same universal language in the tones of the nineteenth century. They fill the life of every student with the larger currents of the great social organism of which he is a self-conscious cell. They enable him to see his own time "with other, larger eyes," and thus cultivate in him that detachment of judgment from all that is selfish and partisan, possessing which he can act his own part in life more grandly than he otherwise would. Literature gives a culture that science alone cannot give; for science has to do with nature, whereas literature deals with man, and it is impossible to reflect too often on the truth that in the world there is nothing great but man, and in man nothing great but mind.

There were, however, and there still are, sufficient reasons for the division of literature into two sections. If we could speak French as freely and accurately as our French-Canadian compatriots speak English, it might be unnecessary. But we cannot. Our education was neglected, and we are now too stupid to learn. I hope that it shall be otherwise with our children. It is said that when two successive ministers from the United States to France in the eighteenth century were, the one deaf

and the other unable to speak French, the King remarked what a singular country it must be that apparently required its ambassador to be either deaf or dumb! Most of us would have to be dumb in a French-speaking assembly. The result, then, of our two literary sections meeting together would be—what with French politeness and English incapacity—that almost the whole business would be transacted in English. Not only would the French language be crowded out of the proceedings, but departments of literature that French-Canadians have made their own might be neglected. Besides, the French section has vindicated its right to exist. The members belong to one Province, and are therefore able to meet in Ottawa or Montreal far more regularly than the members of the English section, who are scattered over half-a-dozen provinces, all the way from Nova Scotia to the Saskatchewan. They contribute, too, a sufficient number of papers to take up all the time that can be allowed at the annual meetings, and there is an audience sufficiently large for discussion and criticism.

It is different with the section to which I have the honour or the misfortune to belong. From its birth it has been in a condition of anæmia. A good many valuable papers have been contributed, but they belong to one department or another of science rather than to pure literature. Indeed, the first president of the section could not avoid expressing in his inaugural address his regret at the assignment to us of what to some, he naively remarked, might "appear to be its pre-eminent characteristic." "The vague comprehensiveness of the title of English literature," he went on to say, "will, I believe, only hamper and weaken this section; and I earnestly trust that—except in so far as the adequate treatment of any of the subjects of so comprehensive a field of study and research may be assumed to furnish contributions to English literature—*that department will no longer be assigned to us;* but that, in lieu of it, the entire work properly included under the titles of history and archæology, with whatever else may be recognized as legitimately embraced in the term 'allied subjects,' shall constitute the work of the section." No language could express more forcibly the melancholy conviction of our first president that there was really no function to be discharged by "the English Literature Section" of the Royal Society. Lord Lansdowne did not propose anything so sweeping as the removal of English from the English Literature Section. That, he must have felt, would be making us something like the proverbial dish of bacon and beans without the bacon. But, evidently from the same feeling of embarrassment that instigated the expression of the president's hope, he suggested that we might take the place, to some extent, of the English historical manuscript commissions, whose task is to investigate and report upon the great mass of valuable materials which are scattered about the country. I am afraid that that would simply mean that we should do badly the work which the Dominion archivist, Mr. Brymner, is doing well.

It is time, then, it seems to me, that the society should face the question, whether there should be an English Literature Section or not. Philology, archæology, geography, Indian antiquities, philosophy, constitutional history, are all interesting and important subjects, but they are not literature. Can there be an English Literature Section, and what functions should it discharge? To get a satisfactory answer to this question, let us consider what were the functions the French Academy set before itself. It is the oldest and the most celebrated literary society in the world, and its history may be a guide to us.

From the date of its formation by Cardinal Richelieu in 1635. the academy set before itself two great aims: to preserve the purity of the French language, and to draw up unalterable standards of literary excellence to which all writers must conform. It may be questioned whether its influence has been wholly good along either of those lines, or whether the good that it has done might not have been attained even had the academy never existed. French authorities declare that, so far as language is concerned, it has been a barrier to enrichment, and that it has repressed rather than encouraged genius and national life. M. Paul Albert satirically recounts its early labours in drawing up the dictionary and in criticizing Corneille. "Richelieu," he says, like all true tyrants, had literary pretensions," and meant that it should be his slave. He intimated, for instance, that the academicians should censure the "Cid." They hesitated, but his Eminence gave the word through his factotum, Bois-Robert,

"Faites savoir à ces messieurs que je les aimerai comme ils m'aimeront." They yielded and produced "Les Sentiments de l'Académie sur le Cid." Again, M. Albert says: "Outre les harangues officielles, fleau dont Racine priait Dieu de préserver le roi, l'Académie qui venait de fonder le prix d'éloquence et le prix de poésie, ne trouva pas de plus belle matière à offrir aux concurrents, pendant près de soixante années, que les infinis mérites de Louis XIV. Un jour, elle proposait le sujet suivant, "Quelle est de toutes les vertus de monarque celle que mérite la préférence?" Le roi, averti, modifia le texte et se contenta de cette rédaction modeste; le roi n'est pas moins distingué par les vertus qui font l'honnête homme que par celles qui font les grands rois." "Veut on avoir un idée du ton de ces compositions consacrées à la glorification de Louis XIV et couronnées par l'Académie? La Monnoye, un des lauréats, disait,

"'Sagesse, esprit, grandeur, courage, majesté,
Tout nous montre en Louis une divinité!'"

We must remember that the atmosphere of the seventeenth and eighteenth centuries was favourable to breeding lickspittles, and that English and Irish, as well as French specimens of the class, abounded. Swift crucifies them in the passage which Thackeray pronounces "the best stroke of humour, if there be a best in that abounding book, where Gulliver in the unpronounceable country describes his parting from his master, the horse." "I took," he says, "a second leave of my master, but, as I was going to prostrate myself to kiss his hoof, he did me the honour to raise it gently to my mouth. I am not ignorant how much I have been censured for mentioning this last particular. Detractors are pleased to think it improbable that so illustrious a person should descend to give so great a mark of distinction to a creature so inferior as I. Neither have I forgotten how apt some travellers are to boast of extraordinary favours they have received. But if these censurers were better acquainted with the noble and courteous disposition of the Houyhnhnms they would soon change their opinion." No one will say that Swift's satire is too severe, who reads the adulations actually offered by the academicians to Richelieu and Louis XIV, or the prostration of Swift himself before Sir William Temple. Reading what was done in former days, I am amazed that we offered no scrap of sweet taffy to Lord Lorne or the Princess Louise. The academicians, however, did set to work to draw up a dictionary that would forever preserve the French language in its purity. The great minister, Colbert, who wanted to know whether the State was getting money's worth for its money, looked in on them one day to see how they were getting along with their work, and found that after forty years' labour they had got as far as the word "ami." We are told that the minister went away penetrated with admiration "pour la sage lenteur, la conscience, l'érudition profonde qu'apportaient à leur tâche ces hommes éminents." M. Albert sums up the first section of his chapter on the Academy in a verdict that sounds like "guilty, but with a recommendation to mercy." "Aussi l'influence de l'Académie sur la direction des esprits fut nulle ou funeste. Elle ne produisit que deux ouvrages, les Sentiments sur le Cid et le Dictionnaire. Le premier est un faible morçeau de critique littéraire, le second fut condamné dès sa naissance, et l'Académie elle-même le refondit entièrement cinquante ans plus tard." Still, in spite of this adverse verdict, which we must remember is not unchallenged, and in spite of admitted early mistakes and limitations, the French Academy has done excellent work in many ways. It has been, and is, a power in France. The greatest Frenchmen cannot afford to dispense with its recognitions, while to be enrolled as a member is regarded as the highest honour even by a Victor Hugo.

No society, however, in London or anywhere else in English-speaking lands, will ever be allowed an authoritative censorship of the English language. The practice of the best speakers and writers, as well as general popular usage, will always be the supreme arbiters. New words and phrases will be continually added, enriching the language and making it better fitted for world-wide use. Neither will any society be allowed to impose its own standards, or the standards of one age, as absolute and for all time. There has been proof enough to satisfy Englishmen that attempts at intellectual dic-

tatorship have been injurious rather than helpful to thought. In our own country dictators have sought to ignore or to crush, successively, every one who from time to time introduced new literary forms that were but the clothing of new forms of idealism or larger conceptions than the old. Jeffrey's critique of Wordsworth's "Excursion" is not a solitary example in England of the incapacity of the old to understand the new, any more than the Academy's "Sentiments sur le Cid" is a solitary example in France. In a volume of the Camelot series, entitled "Early Reviews of Great Writers," we find instances equally astonishing, all tending to prove that great literary men, like great painters, or the greatest masters of music, must make up their minds to form their own constituencies. If they live long enough, they may triumph over the regular and the commonplace and receive due appreciation. If they die young, they can only hope that posterity will do them justice. "Dissenters from the established systems in poetry and criticism," as the 'Edinburgh Review' called the lake school, must expect no mercy from men who believe in fixed literary standards. The 'Quarterly Review' understood Keats no better than the 'Edinburgh' understood the lake school. 'Blackwood' was as hopelessly dense when dealing with what it called the "cockney school of poetry," of which Leigh Hunt was declared to be the head and Shelley and Keats disciples. The 'Monthly Review,' in criticizing Burns, is able to discern merit in the "Cottar's Saturday Night," but gives an anglified version of what it calls "this little performance," explaining, with calm consciousness of superior merit, "We have used the freedom to modernize the orthography a little, wherever the measure would permit, to render it less disgusting to our readers south of the Tweed." These reviews, we must remember, combined the highest literary talent of the time, and generally meant to be honest and impartial. They were far ahead of any journals that had ever been attempted in England before, yet how helpless they are in the presence of any new force! They do not understand it, and as it is their business to stamp it with an authoritative label, they can only damn with faint praise or condemn. This is bad enough, so far as misleading the public and wounding the spirit or suppressing—so far as it can be suppressed—the genius of a Byron, a Carlyle, or a Browning is concerned. Admittedly there is power enough on the side of injustice when Jupiter is only a leading journal. Fortunately, however, in that case, another organ of opinion can be started, and the disciples of the new master may find their way into the old journal, and gradually change its voice. But when Jupiter is an organization venerable by age, and representing what is supposed to be the whole literary judgment of the country, from which there is no appeal, the injustice is apt to be overpowering. The true teachers of every epoch are the men who have most thoroughly absorbed all its light and its questionings, as well as its deepest convictions, who are in sympathy with its ideals and unexpressed faith, and who, because of deeper insight than the established teachers possess, have found some solutions, even though they may be only partial, for the problems with which it is wrestling. Whether they write in prose or verse matters nothing. They may express themselves in dramas, epics or lyrics; in novels and essays; in lectures and criticisms; in biographies and histories; in sermons or in maxims of piety and christianity; but according to their insight into the open secret of the world and their knowledge of the best that has been thought and said by the best minds, they are literary men and the formative forces of their day. What they write is accepted by the age as the expression of its heart and the guide of its life. Therefore their works follow them. It is not given to every epoch to have one man who sums up in himself its characteristic spiritual forces and who can reflect them in perfect literary forms that shall be sources and instruments of culture for all time. How many dead centuries Homer represents we know not; but Dante voices "in mystic, unfathomable song" ten silent centuries; and Shakespeare interprets to us the same epoch from the practical side of life, and reflects the Renaissance and that modern fulness of thought of which it was the dawn. "From 1780 to 1830, Germany," says M. Taine, "produced all the ideas of our historical age, and one man, Goethe, summed them up in himself." In due time we shall have a man great enough to rethink them with a power equal to Dante's and a range equal to Shakespeare's. Such a supreme literary man is what our complex age is waiting for. So far we have had only an earnest—an ear-

nest, it is true, of extraordinary promise—but the full harvest is yet to come. In giving this estimate of what our own age has done, there is no intention of doing any injustice to the great literary products of England and America throughout the whole of this century; but in judging from the highest point of view, it is possible to be impartial and not to allow ourselves to be unduly influenced by the bulk which the present has when it is too close to our vision. Matthew Arnold rightly says that "the burst of creative activity in our literature, through the first quarter of this century, had about it something premature; . . . in other words, that it did not know enough. This makes Byron so empty of matter, Shelley so incoherent, Wordsworth even, profound as he is, yet so wanting in completeness and variety." Neither can any of their successors be said to have attained absolutely the first rank. Tennyson is too much of the mere Englishman. Faultless artist, so far as form is concerned, his substance is due to Milton and Keats, with the local colouring of the insular English life of his own time. Robert Browning is far wider in outlook, in thought, in sympathy and in scholarship, but he will not be accepted as the full and final interpreter of our century. America, of course, could not be expected to produce such a man, for "the life and the world of modern times are very complex things," and America is so big that it has scarcely been able to realize itself, still less to understand the modern world. Longfellow is little more than a reflection of the English poets. Whittier's verse flows sweetly and is always pure, but can much more be honestly said? That he is a Quaker is his strength and his weakness. Everyone respects the Quakers, but the whole world will never put on their sober garb. Walt Whitman is in sympathy with the democratic spirit of the age, but he is hopelessly formless and chaotic. Lowell is master of an original form of satire, but satire is not by any means the highest expression of literature. Emerson is the greatest literary man that America has produced, but he is too ethereal to become daily food for millions. When literature is on so vast a scale and of so many varied and continually changing types of excellence, when its functions are so lofty and all-pervasive, and when the history to which we have referred proves the incapacity of the ablest men to fix its bounds, it is clear that it would be folly for the English Literature Section of the Royal Society of Canada to undertake anything like the work of the French Academy. A society in London would not be allowed to exercise the function of preserving the purity of the language or of fixing literary standards; much less would a society in the United States, Canada or Australia. The question, then, comes up: What function can we discharge? Can we be of any use to the State? For if not, the section may serve the society best by performing the "happy-despatch." It seems to me that there is a function that our section might discharge, a work related to the condition of things in Canada and to practical life, both in the lower and higher sense of the word practical, and therefore more useful to the State than either of the aims which the French Academy set before itself. It might organize a course of study that should bring out the educational value that is implicit in English literature, and especially its practical relations to life, for use in Canadian schools from the lowest to the highest. For what is the highest university but a school! As Carlyle says, all that a university can do for us is still but what the first school began doing—teach us to read. If we could do anything towards organizing such a course of study, we would help to solve a pressing problem in education and confer an inestimable boon on the State, for the highest object of the State must be the education of the people.

Let me explain more fully what is included in this object which I contemplate, its practical value, the means now being taken to secure its realization, and the relation that our section would occupy to provincial and local societies that have the same end in view.

The fundamental principle in education must be to develop all that is best in man, and so fit him for the best work that he can do in the world, and for the destiny to which we believe him to be heir. That only can be called a liberal education which deals with each scholar as a man and not a creature intended to be a mere craftsman, which lifts the individual out of his self-life and puts him in proper relations to the past and to his work. The great mass of men must get this education through actual connection with the world in their discharge of daily duties and their relations to the family, the

state and the church. To these universal means of culture the school is now, by common consent, superadded. If nothing else is taught in it save the ability to read, a key is thereby put into the hand of the capable scholar by which he can open innumerable doors. The masterpieces of his own literature are, at any rate, open to him, and by the study of these he can obtain that comprehension of life which is the essence of education. Secondary schools and universities aim at a culture for the few who can avail themselves of it, that puts within their reach not only the best thought of their own nation but of the world. There they learn to "read in various languages, in various sciences." The study of Latin and Greek was once thought the only means for attaining this liberal culture, and I am one of those who consider it to be, on the whole, the best means still. When, however, the study of the ancient classics degenerated into mechanical verse-making or the minute analysis of words, it ceased to be humanistic. No wonder that a reaction took place. All through this century the cry has been heard: "Back to nature; nature at any rate is better than dead languages. Study science. Science is the knowledge of real things and not of mere vocables." It is now acknowledged, however, that this second extreme is as bad as the first. The study of the natural sciences has not yielded what was once fondly expected. It is again felt true that education must consist in the study of man and of society, and that, of course, can be found only in literature. Must all who would be scholars fall back, then, on Latin and Greek? By no means. Modern life is too complex to be satisfied with only one form of the humanities. In every country that possesses a great literature the question is being asked, Is it not possible to so organize the study of that literature that vast numbers who can not spare the time necessary to master the ancient classics may receive some share in the common inheritance of intellectual life that has been accumulated by the race to which they belong, and so be enabled to live a fuller life than they otherwise would? Is it not possible to make the study of English literature interesting and practically related to life, even in common and in high schools; and in the universities to make it one of the means by which a type of thorough liberal culture can be secured? With regard to this question Mr. Freeman declares that English literature cannot be taught, "because it does not deal with facts, but is a matter of taste and opinion, for which there is no agreement; again, because it cannot be crammed, and, lastly, because it cannot be examined upon. He therefore calls on us to give up all efforts to teach literature." ('Contemporary Review,' October, 1889.) Mr. Freeman always speaks so dogmatically that he silences or frightens timid people. It must also be confessed that English literature has generally been taught in such a way that scholars have not been allured to its further study. They have sometimes been rather made to hate it, and their departure from school or college has been to them the signal for selling off their books, and thereafter confining themselves to newspapers. Now, I do not undervalue the education given by the press. If we could only succeed in establishing the ideal newspaper, it might be very considerable. But, after all, newspapers must deal to a great extent with the local, the temporary, the accidental, the sensational, the partial and incomplete; and the man who trusts his education to them will, of necessity, be a scrappy creature intellectually. In spite, however, of Mr. Freeman's magisterial utterances and of admitted failure in the past, I am inclined to think that the study of English literature can be organized, and that it might be made to take a place second to that which the ancient classics long held as an effective means of discipline and culture. We must admit that only an occasional student now acquires "such a mastery of the classical languages as to make them a more effective means than his native speech and his native literature for teaching him all the varied powers of language, the significance of style, the secret force of rhythm, the psychological relations between thought and expression, the development of literature as representing the character and intellectual life of a nation; all this culture, in which lies the key to the higher phenomena of history and life, the student will, in many cases, now acquire more naturally and more thoroughly from the study of English than from the study of foreign authors." It is true, adds Prof. Cappon, from whom I have just quoted, that there is considerable difficulty in organizing all this knowledge in an English course, considerable difficulty in finding practical methods of teaching it, and, lastly, considerable difficulty in exam-

ining upon it. All the more need that it should be taken in hand. The subject is new, but its educational importance is incalculable. To succeed in what we aim at, a great deal of united work will be required, and that work, far from being done at once, will have to continue so long as the mind grows and new forms of idealism are created. What would be the place of the English Literature Section of the Royal Society in this contemplated work? Its place is marked out by its position as the one literary or educational organization that is wide as the Dominion. At present, volunteer societies are dealing with the very question concerned. Two years ago a Modern Language Association was formed in Toronto, composed largely of Ontario university professors and lecturers and representatives of the high schools. That association is in a condition of vigorous life that is a significant contrast to the lifelessness of our section. Its discussions are helpful to professional students and teachers of English and other modern languages, besides tending to guide public opinion aright. The subjects of discussion open to its members are of exhaustless interest, as Prof. Cappon has indicated in the sentences I have just quoted. When provincial societies are doing this work, because the subject of education is by our constitution entrusted to the provinces, should not our society seek to encourage their efforts and combine them, so that the learning and experience of one province might be a benefit to all?

What would be necessary to make our section a living bond between such provincial professional societies? In the first place, the number of our members would need to be enlarged. Discussions are of no value unless among men who understand a subject. When only half a dozen members are present at a meeting, a majority of these probably interested in science or the border-land between science and literature, there can be no discussion regarding literary forms, methods or relations. Our section should include the professors of English literature in every considerable university in the Dominion. At present it does not include the professors of Dalhousie, Fredericton, McGill, Queen's, Trinity or Toronto; that is, it excludes the men most competent to discuss English literature. It should also, I think, include representatives of secondary schools, and young Canadians who have done good work in English literature and who would be willing to take trouble to bring the section into relation to provincial educational forces. It may be asked:—why should we have forty or fifty members when the other sections of the society can do their work with twenty? There are special reasons in their cases, as I have shown, though perhaps they, too, have hardly considered whether they might not do their work better if they opened their doors more widely. Some of the most eminent mathematicians, chemists and physicists in Canada are not in the sections devoted to those sciences, and some of the most eminent biologists are not in the other science section. I may frankly say that I see no good reason for the exclusion of such men; but the question now is, not whether the membership of all the sections should be increased, but whether the section that feels that it must have more members, if it is to do the best possible work for the State, should be permitted its proper development. We must not forget that the Royal Society is a union of several academies, and as each of these must stand or fall on its own merits, it should be allowed modifications of its original constitution that experience shows to be required. If it is thought that this might give one section a preponderance in the councils of the society, that could be guarded against by allowing it a vote equal only to that of each of the other sections.

In the second place, the society should meet in different centres of the Dominion in order to interest the public in its aims and to enlist the co-operation of local scientific men and professional educators. Montreal has fitly taken the initiative already in this new departure, and I am glad to hear that the society is invited to hold its next annual meeting in Toronto. Our headquarters must be in Ottawa, and I trust that before long we may secure offices there and a paid secretary. We cannot expect our honourary secretary to continue doing so much of the actual work of the society any longer. We owe almost everything to him. The Parliament of Canada has sustained us generously. The representatives of the Queen have given us every possible encouragement. Sir William Dawson, our first president, has always been in the front. But to no one is our comparative pros-

perity so due as to Dr. Bourinot; from first to last he has taken the heavy oar, and it is hardly too much to say that but for his devotion and untiring industry the society would hardly have continued to exist in its entirety.

Gentlemen, my object in giving this address has been to show where and why the society is weakest, in order that we may consider how best to give it strength for effective work. The object that animates us is to do something for Canada. Our society represents Canada, and the spirit that made us a country a quarter of a century ago; the spirit which will enable us to triumph over all the centrifugal forces which are at work in every young country, "the determination of our people," as Lord Lansdowne expressed it in Montreal seven years ago, "to be something more than a fortuitous aggregate of provinces, without national life, or national statesmanship, or national policy, or national culture, or national precautions for defence."

The Vice-President, Abbé Laflamme then addressed the meeting as follows:—

Excellence, Mesdames, Messieurs, — La Société Royale n'a pas encore d'édifice qui soit sa propriété: elle ne possède pas de salle où elle puisse tenir ses séances. Bien plus, elle ne sait pas trop où déposer les volumes de ses mémoires ainsi que les ouvrages nombreux et importants qui lui arrivent chaque année sous forme d'échange ou autrement. Cette pauvreté, édifiante peut-être aux yeux de quelques-uns, n'en constitue pas moins un état de gêne qui ne saurait durer indéfiniment, et elle espère toujours rencontrer quelque part un généreux Mécène qui lui assure, non pas la fortune, mais un asile convenable, un local où elle puisse tenir ses réunions annuelles, recevoir ses amis, et exhiber, pour le plus grand profit de tous, les trésors qui s'accumulent dans ses archives.

Qui sait si cette idée de se faire un nid quelque part n'a pas contribué dans une certaine mesure à lui faire accepter, l'année dernière, l'invitation si bienveillante, à elle faite par la Société d'histoire naturelle de Montréal, de venir tenir sa séance annuelle de 1891 dans la métropole commerciale du Canada ?

Montréal a donné si largement, ces dernières années, pour la grande cause de l'éducation supérieure, que notre Société pouvait bien se dire à elle-même que si, pour la diplomatie européenne, la lumière est quelquefois venue du Nord, suivant la parole d'un diplomate italien, les fondations généreuses paraissent devoir venir de ce côté-ci de notre pays.

De plus, après dix ans d'existence, une société comme la nôtre est encore jeune, et, bien qu'elle n'ait pas la tête aussi légère que la tortue de Lafontaine, on comprend qu'il lui vienne de temps à autre l'envie de voir le monde, son monde des différentes parties du Canada, celui pour lequel elle travaille, celui qu'elle voudrait surtout contribuer à éclairer dans la mesure de ses forces.

De ces excursions, je ne dis pas hors de son logis, puisqu'elle n'en a pas, mais parmi ses amis des différentes villes du Dominion, elle compte bien d'ailleurs retirer son profit. Tout d'abord, elle prétend, en agissant ainsi, obéir à un désir de son fondateur, le marquis de Lorne, qui, dès le commencement, voulait qu'elle tînt ses séances générales successivement dans les différentes villes du pays, et ensuite elle voudrait se faire connaître. Lui pardonnerez-vous cette pointe de vanité légitime ? J'ose l'espérer, quand vous aurez été à même de constater le sérieux et l'importance de ses travaux. Vous verrez alors que ses membres sont tous des travailleurs consciencieux qui n'hésitent pas devant la tâche, quelque rude qu'elle soit, dès qu'il s'agit de trouver la vérité pour eux-mêmes et de la faire connaître aux autres.

Cette propagande scientifique, la Société Royale, dès le commencement de son existence, l'a placée en tête de son programme, puisque dès sa première réunion, les différentes sociétés littéraires et scientifiques du Canada étaient invitées à s'inscrire sur la liste des sociétés affiliées et à lui faire, en séance solennelle, le rapport de leurs travaux. Dès le commencement encore, elle affirmait hautement sa volonté de reconnaître publiquement, par des diplômes ou des prix, lorsqu'elle en aurait les moyens,

la valeur de travaux exceptionnels faits par des Canadiens qui n'appartiennent pas encore à l'une de ses quatre sections. Depuis sa fondation, notre Société a été fidèle à cette partie de son programme, et plusieurs ouvrages ont déjà été couronnés et ont reçu la consécration publique et pour ainsi dire officielle de leur mérite.

La Société Royale canadienne est donc bien de son siècle, de notre siècle qui a été appelé le siècle des lumières. Nous ne voulons pas cependant prendre pour le moment la responsabilité d'une telle qualification par trop flatteuse pour notre époque. Car, en fin de compte, les lumières de notre temps n'ont pas encore dissipé toutes les ténèbres, et le livre que l'on ferait avec ce que nous ne savons pas serait beaucoup plus volumineux que celui qui contiendrait toute la somme de nos connaissances. Pascal disait jadis qu'on ne connaît le tout de rien, et ce triste aveu d'un grand génie reste encore vrai après deux siècles de travaux et de découvertes. Les bornes de l'ignorance ont été reculées de quelques pas, et voilà tout. Et l'on comprend parfaitement comment M. A. Gaudry, le prince des paléontologistes français, disait humblement, après ses recherches classiques sur les fossiles de Pikermi, qu'il était tout simplement devenu un peu moins ignorant que la veille.

Ainsi donc la clarté qui illumine notre temps n'a pas fait disparaître toutes les ombres. Voilà pourquoi je crois qu'on se rapprocherait plus de la vérité en appelant tout simplement notre siècle : celui des chercheurs et des travailleurs.

En effet, il est impossible de le nier, jamais, dans le domaine seul de la science, on n'a vu tant de penseurs à l'œuvre, tant de découvertes merveilleuses se faire en si peu de temps. Ç'a été comme une fièvre qui a tout à coup envahi le monde des savants. Et si le développement des sciences se continue avec la même rapidité, il est absolument impossible de prévoir ce qu'il sera dans cinquante ans.

Mais ce n'est pas du développement merveilleux des connaissances humaines que je voudrais vous entretenir. Il est une autre tendance de notre époque qui mérite à la fois de fixer l'attention et d'attirer la sympathie de tous les penseurs. Je veux parler du désir sincère que l'on a de divulguer, de populariser dans toutes les classes les connaissances intellectuelles. Dans cette grande république du savoir, dans ce grand festin de la science, on veut que tout le monde ait sa place et que personne ne soit de trop. Que les recrues arrivent des palais ou des carrefours, elles sont toujours bienvenues.

Et, qu'on le sache bien, le but que l'on a en vue n'est rien moins que la satisfaction d'une sotte vanité par l'étalage de ses talents personnels. On espère plutôt infuser, pour ainsi dire, dans tous les rangs de la société, sans distinction, les connaissances acquises par les chercheurs, et relever ainsi le niveau intellectuel des masses, les moraliser, et—qui sait même ?—peut-être les rendre plus faciles à gouverner.

Disons-le immédiatement, ce n'est pas là une vaine utopie. A une condition toutefois : c'est qu'on ne s'adresse pas seulement à l'intelligence, mais qu'on atteigne en même temps le cœur par une morale basée sur de solides principes religieux, et que l'on affermisse le jugement par les données d'une philosophie saine et éclairée.

C'est un peu dans ce but, d'ailleurs, d'éclairer et de moraliser le peuple, que les révolutionnaires d'un autre âge proclamaient il y a plus d'un siècle l'égalité de tous les hommes. Cette vision chimérique des égalitaires à outrance ne pouvait tenir devant l'expérience. Sans doute tous les hommes sont égaux devant Dieu et devant la loi. J'ajouterais même que tous les hommes, au moins tous les électeurs, sont égaux au point de vue des droits politiques. Mais quant au reste, il y a lieu de faire des distinctions ; et le principe d'égalité absolue appliqué au genre humain n'a jamais été et ne sera jamais qu'un de ces rêves inventés par des cerveaux en délire et capables tout au plus de faire des dupes.

Cependant il est un point sur lequel on aimerait à voir régner une égalité plus grande que celle qui existe, un point sur lequel elle n'est peut-être pas irréalisable, au moins dans une certaine mesure, c'est l'instruction, c'est le développement des facultés intellectuelles.

Ne serait-il pas à souhaiter que ce bienfait inappréciable de la science, dans le sens le plus large du mot, fût à la portée de tous, que toutes les intelligences fussent à même de se développer dans la limite de leurs forces et de donner ainsi à la société un concours plus éclairé et plus efficace ? Sans

doute, l'inégalité intellectuelle existera toujours, mais on peut bien se demander s'il ne serait pas préférable de voir l'instruction tellement organisée que, s'échappant des sommets universitaires comme d'une source toujours abondante et pure, elle se répandît ensuite de toutes parts et couvrît tout le pays de ses eaux fécondes. A ce fleuve béni les citoyens viendraient puiser suivant la mesure de leurs forces. Les uns n'en remporteraient que quelques gouttes peut-être, mais d'autres en prendraient plus abondamment; tous au moins pourraient s'abreuver à loisir.

Du reste, nous voyons de nos jours une tendance très marquée de la part des gouvernants à travailler dans ce sens. On encourage l'instruction sous toutes ses formes. Non contents de donner une nouvelle impulsion aux écoles élémentaires qui atteignent la grande masse des classes inférieures, on établit à grands frais des écoles spéciales de technologie, on soigne, on discute plus que jamais l'enseignement des collèges et des écoles secondaires. Les cours universitaires eux-mêmes deviennent plus nombreux et plus complets. En un mot, il se fait un mouvement d'ensemble très sérieux, afin d'établir dans toutes les classes de la société un niveau intellectuel plus élevé. C'est précisément cet élan que nous aimerions à voir se généraliser et s'étendre davantage.

On pourrait en espérer des merveilles, mais à une condition, c'est qu'on s'applique moins à faire apprendre beaucoup qu'à inspirer aux étudiants l'amour de ce qu'on leur enseigne. "Je ne puis admettre, disait dernièrement M. Moulton, que vous ayez appris à lire à un enfant, si vous ne lui avez pas inspiré en même temps l'amour, le goût de la lecture." Inspirer de l'intérêt pour la matière que l'on travaille, c'est donner de la vie à l'instruction. Autrement, cette dernière n'est plus, pour ainsi dire, qu'une émotion galvanique et factice, qui s'éteint le jour où le maître et l'élève ne sont plus en présence.

Pourquoi ne pas avouer qu'à ce point de vue, notre système actuel d'instruction n'est pas parfait? Quels sont les élèves qui, au sortir du collège, emportent avec eux un amour véritable pour les auteurs qu'on leur a fait traduire? Au contraire, n'est-il pas de règle générale d'éprouver un sentiment de satisfaction à l'idée qu'on n'aura plus à parcourir des pages classiques où les difficultés à vaincre ont toujours paru l'emporter de beaucoup sur les jouissances à goûter? Macaulay nous parle de fermiers hollandais qui, après leur journée faite, se reposent de leurs pénibles travaux en lisant les Géorgiques de Virgile dans le texte! Sans vouloir offenser qui que ce soit, il serait peut-être assez restreint parmi nous le nombre, je ne dis pas des cultivateurs, mais des gens de profession qui trouveraient plus de plaisir à lire dans le texte une ode d'Horace ou un discours de Cicéron, que la gazette du jour ou le roman à la mode.

A celui qui réalisera dans notre système d'éducation l'immense progrès de faire aimer les choses apprises au collège, la patrie devrait élever une statue, puisque, du coup, il aurait assuré pour l'avenir le fruit de longues années consacrées à des études dont les résultats sont souvent malheureusement en grande partie compromis sinon complètement perdus.

En attendant qne l'on découvre cette panacée qui, au fond, n'est pas aussi difficile à trouver que la pierre philosophale, vous me permettrez de vous exposer en quelques mots un système spécial d'instruction destiné aux adultes de toutes les classes, et qui a déjà produit de merveilleux effets au point de vue de la diffusion des connaissances intellectuelles. Je veux parler de l'*extension universitaire*, comme on l'a appelée en Angleterre, où on l'a essayée pour la première fois. Les résultats en ont été tellement encourageants que, l'année dernière, l'université de Pennsylvanie en a fait l'essai à Philadelphie et dans les villes et villages voisins, avec un succès qui a dépassé toutes les espérances.

M. Moulton définit l'extension universitaire: "l'instruction universitaire mise à la portée de toute la nation, grâce au concours de professeurs ambulants." Sa mise en œuvre n'exige pas nécessairement qu'une université soit placée à la tête. A Londres, une branche très florissante de ce système est dirigée par un comité central, qui, tout en n'ayant rien d'universitaire en lui-même, est cependant en relation avec trois universités. Il s'agit tout simplement de mettre à la portée de tous, surtout de ceux qui peinent et dont les loisirs sont très limités, les avantages de l'enseignement universitaire, et cela suivant les goûts de chacun. A proprement parler, c'est l'université du travailleur et de l'employé.

Avant d'aller plus loin, disons tout de suite qu'on ne prétend pas transformer en savants, spécialistes, jurisconsultes ou lettrés, des portiers, des garçons de boutique, des mineurs ou des manœuvres quelconques. Mais on veut intéresser les intelligences en leur communiquant des connaissances d'un ordre supérieur; on veut ouvrir à ces braves gens l'horizon de nouvelles connaissances essentiellement moralisatrices, et relever autant que possible,—et l'on y réussit quelquefois d'une manière surprenante, —ces esprits souvent aussi riches et aussi puissants, sinon plus, que ceux qui leur enseignent.

Voici maintenant comment fonctionne ce système d'extension universitaire.

On organise d'abord un comité central chargé de recevoir les demandes de cours, de trouver dans les universités les professeurs nécessaires, et de voir au paiement de leurs honoraires. Chaque cours dure trois mois, à une leçon par semaine, leçon qui est toujours donnée le soir. Le cours comprend quatre choses. Il y a d'abord la leçon elle-même, d'environ une heure. Puis les étudiants ont entre les mains un sommaire de tout le cours, divisé en douze leçons, ce qui les exempte de prendre des notes. A la fin de chaque leçon, le sommaire indique les auteurs à lire et un certain nombre d'exercices à faire, exercices calculés de façon à moins éprouver la mémoire des étudiants qu'à les habituer à faire un travail personnel sur un sujet donné. Ces devoirs se font à la maison, et les élèves ont pour cela toute liberté de consulter qui ils veulent, de lire les auteurs qu'ils ont sous la main. Une fois terminés, les travaux sont remis aux professeurs.

C'est dans la classe qui suit immédiatement la leçon, que le professeur, dans une causerie familière avec les élèves, rend compte de ces devoirs. Il est évident que cette classe, bien faite, est encore plus intéressante et plus utile que la leçon elle-même. Dans cette communication intime des élèves avec le professeur, les derniers nuages disparaissent, les dernières difficultés s'évanouissent, et l'enseignement atteint définitivement toute sa portée.

Veut-on savoir où se font ces cours ? Ils se donnent là où ils sont demandés. Chaque localité choisit le sujet ou les sujets qu'elle désire être enseignés, et le professeur spécial lui arrive.

Les auditoires que réunissent ces cours sont extrêmement mêlés, à peu près comme les passagers d'un tramway ou la foule qui remplit les églises. La partie délicate et difficile pour le professeur est d'intéresser tout son monde, et de s'assurer ainsi quelques élèves sérieux qui feront les exercices après chaque leçon, et retireront ainsi tout le fruit possible de cet enseignement. Un grand nombre ne font qu'assister aux leçons, ce qui ne laisse pas de leur être encore d'un grand profit.

Quant aux devoirs des élèves, la variété en est naturellement très grande. Vous y trouvez, avec la production d'esprits sérieux, éclairés et vraiment instruits, le résultat des efforts de gens sachant à peine écrire, complètement brouillés avec l'orthographe, en révolte absolue contre les règles de la grammaire, ce qui ne les empêche pas de raisonner juste et de profiter autant que les autres des leçons du professeur. On a vu de ces devoirs tellement longs que l'auteur, par mesure de prudence, y avait ajouté une table de matières. Un autre était encore plus développé, mais comme son auteur vivait dans une maison de santé, la correction n'en a pas été jugée nécessaire.

En Angleterre, on demande surtout des cours de littérature, d'histoire et d'économie politique, bien que les sciences pures et appliquées aient aussi une bonne part de popularité. Aux Etats-Unis, les sciences exactes, pures ou appliquées, sont plus en vogue ; ce qui est bien conforme au génie éminemment pratique de nos voisins. Chose curieuse, nulle part, soit en Angleterre, soit aux Etats-Unis, on a demandé des cours spéciaux sur les classiques,—bien que les cours de littérature grecque et latine, donnés *en anglais*, aient été assez recherchés.

Le nombre des élèves est en moyenne très élevé. L'hiver dernier, l'université de Pennsylvanie a donné, à Philadelphie ou dans les environs, quarante cours, avec une assistance totale de 45,000 personnes, et une assistance moyenne de 9,500.

A la fin de chaque cours, les élèves passent un examen, dont le résultat, ajouté à celui des devoirs de chaque semaine, est consigné dans un diplôme qui leur est décerné. Les professeurs sont unanimes à dire que ces examens égalent pour le moins les examens universitaires ordinaires. Aussi les universités anglaises, dans certaines occasions, donnent-elles aux porteurs de ces diplômes le titre de S. A.

(*students affiliated*) qui confère des priviléges spéciaux à ceux qui pourraient dans la suite faire un cours universitaire complet.

Reste la question la plus délicate : comment se paient les professeurs ? Tout d'abord les honoraires ne sont pas élevés. Ils sont de quarante-cinq louis sterling pour les professeurs de Cambridge. Ces sommes sont prélevées en partie parmi les étudiants eux-mêmes, qui donnent une contribution hebdomadaire variant de un à cinquante sous. Mais comme en moyenne ceci ne couvre que les deux tiers des dépenses, le reste est fourni par des institutions ou des philanthropes riches et généreux.

On dit que l'on juge l'arbre à ses fruits ; de même on devra apprécier la valeur de cet enseignement universitaire *ad extra* par l'importance de ses résultats. Tout d'abord, on s'imagine facilement que dans un centre de population où se donnent ces cours, la société doit nécessairement changer de ton. Les conservateurs des bibliothèques locales remarquent que les livres les plus recherchés sont alors plus sérieux que ceux que l'on demande généralement. Les conversations de société deviennent moins frivoles. Aux *five o'clock teas*, on parle de sujets plus graves. Les dames s'entretiennent des leçons auxquelles elles ont assisté, au grand profit, paraît-il, de la charité chrétienne. C'est que l'esprit humain n'est pas, suivant l'expression de M. Moulton, à compartiments étanches, comme la coque de nos navires ; et il est impossible de développer, d'élever une faculté, sans que le reste ne s'en ressente plus ou moins.

L'avantage n'est pas moindre pour les universités elles-mêmes. Elles se font ainsi mieux connaître et apprécier. Cette communication intime avec la masse du peuple met ses professeurs à même de se rendre compte d'une foule de choses qu'ils ignoreraient sans cela, et leurs travaux en retirent un cachet d'actualité qui ajoute beaucoup à leur valeur.

Au moyen âge, les peuples allaient aux universités, et les étudiants devaient se contenter de ce qu'on leur donnait. Dans le système que nous venons d'exposer, ce sont les universités qui vont aux peuples leur distribuer l'enseignement qui leur sera à la fois plus agréable et plus utile. A tout prendre, ce mode vaut peut-être l'ancien.

Mais, encore une fois, ce genre d'instruction, comme tous les autres, ne donne sa mesure que s'il est entre les mains de professeurs zélés. Il faut chez ces derniers quelque étincelle du feu qui anime le missionnaire. Et après tout, cette mission d'enseigner les humbles et les délaissés, n'est-elle pas en elle-même aussi relevée que n'importe quelle autre ? N'y a-t-il pas là une œuvre d'apostolat vraiment capable de tenter les âmes généreuses qui ont soif de s'immoler pour leurs semblables ? L'idée de faire du bien à ses concitoyens, d'éclairer les intelligences de ses frères, est une des plus belles qui se puisse voir, et elle a toujours été l'une des plus fécondes en grands dévouements.

Je vous demande pardon, en terminant, de la longueur de ces détails. J'ai parlé ici surtout pour mes compatriotes de langue française, qui ne suivent pas de très près le développement de l'enseignement des universités anglaises, et il me semble qu'il y a là une leçon, ou mieux un exemple dont nous pouvons tirer profit.

Cette question de la diffusion des connaissances intellectuelles doit intéresser au plus haut point les classes dirigeantes de notre pays, puisque notre avenir en dépend. Nous avons déjà beaucoup fait ; mais, sur ce sujet, la besogne qui reste à faire dépasse toujours et de beaucoup celle qui a été faite. C'est le devoir commun de mettre à profit tous les moyens à notre portée dans l'intérêt de cette grande cause de l'instructien à tous les degrés.

Est-ce donc à dire que nous devions, à la suite de la Grande-Bretagne et des Etats-Unis, organiser ces cours universitaires pour les gens du dehors ? Il me semble que nous ferions bien de l'essayer. Les fruits qu'on en retire là-bas, nous pouvons les espérer ici, et, comme nous ne risquons rien, je ne vois pas ce qui nous empêcherait de tenter l'expérience.

Quant aux fonds nécessaires, il ne seraient peut-être pas difficiles à trouver. Le gouvernement ne reculerait pas devant cette bonne œuvre, et il me semble, qu'à Montréal surtout, dans cette ville si riche et si généreuse, avec ces universités où l'on fait si royalement les choses, cette question de dollars ne serait qu'un détail.

Tout à l'heure, je promettais une statue à celui qui réussirait à créer chez les élèves de nos collèges un amour ardent et durable pour leurs classiques, promettons-en deux à celui qui inaugurera le système de cours universitaires dont je viens de parler.

Quant au rôle de la Société Royale dans tout cela, il ne serait peut-être pas aussi effacé qu'on le croirait à première vue. Qui sait, par exemple, si elle ne pourrait pas former parmi ses membres ce comité central d'organisation qui est partout comme le point de départ, la roue motrice de tout le mécanisme de l'extension universitaire? Ce serait pour elle une nouvelle occasion de remplir la mission que lui a confiée son fondateur, et en même temps, permettez-moi de le dire, un nouveau titre à la reconnaissance des citoyens du Canada.

His Excellency Lord Stanley, in the course of a long and interesting address, suggested that among the high functions of the English literature section, for the continuance of which Principal Grant had so ably and so eloquently pleaded, should be to direct the public mind in such a way as to make the people cease to be contented with second-hand knowledge, with selections from certain writers, and induce them to read the authors' works themselves, and thus gain a clearer insight into the problems with which the writers' intellects were grappling. After paying a graceful tribute to the intellectual accomplishments of Principal Grant, His Excellency bade a hearty welcome to the visitors from the United States, who would, he hoped, visit Ottawa the next time the Royal Society met there. In conclusion he wished prosperity to the society, and expressed the opinion that one of the best and most meritorious tasks which it could perform would be to lead people to aim at being thorough in whatever subjects they chose to study.

A reception was held at the close of the meeting, and the members and delegates present as well as many prominent citizens had an opportunity of paying their respects to the Governor-General.

SESSION II. (*May 28th.*)

The meeting was called to order in the William Molson Hall, on Thursday, May 28, by the President, Very Rev. Dr. G. M. Grant.

Prof. Roberts was introduced as a fellow of the Society by Dr. Patterson, and Mr. L. O. David by Dr. L. H. Fréchette.

The Acting Secretary announced that the Council recommends that rule 6, paragraph 2, be amended, so that the words "two-thirds of the votes of the whole section" shall read "a majority of the whole section."

Dr. Stewart, seconded by Mr. Gisborne, moved the adoption of the recommendation, which was carried.

Dr. Johnson moved, and Colonel G. T. Denison seconded the following motion, which was agreed to.

That in rule 6 concerning the election of fellows, after the words "the matter be referred back to the section concerned" the following be added: "to select names from the candidates nominated and recommend them to the society for election. This selection and recommendation by the section shall be made on the first day of the meeting at 2.30 p.m., unless otherwise ordered at that time by the section. If there be two or more vacancies the selection shall be made by a separate vote for each vacancy."

The Acting Secretary then read the following communication from section III, which, on motion of Dr. Johnson, seconded by Mr. T. Macfarlane, was adopted.

Montreal, May 27th, 1891.

To Dr. George Stewart, Act. Sec. R. S. C.

SIR,

In reply to your communication from the council requesting Section III to select names to fill the three vacancies in that section, and to report at the present meeting, I am directed to inform you that at the meeting of Section III in the afternoon of this day, May 27th, the names of Mr. T. C. Keefer, of Ottawa, Mr. Ellis, of Toronto, and Mr. Goodwin, of Kingston, were selected for recommendation to the society for election as members to fill the vacancies in Section III.

G. P. GIRDWOOD,
Acting Secretary.

The foregoing recommendations of the third section were adopted on motion of Dr. Johnson, seconded by Mr. Macfarlane.

The following reports from affiliated societies were then presented:

IX.—From *The Literary and Historical Society of Quebec,* through Very Rev. Dean NORMAN.

The Literary and Historical Society of Quebec would thank the Royal Society of Canada for their kind invitation to send a representative to the annual session held this year at Montreal, and would state that the society is in a flourishing condition. The grant from the provincial government has been continued and the roll of membership has slightly increased; but it is with regret that the society has to announce the loss by death of the valuable services of two of its members, the Hon. P. J. O. Chauveau, LL.D., for many years a prominent *littérateur*, orator, and statesman, the founder of the department of public instruction of this province, and for some years premier of Quebec, and afterwards speaker of the senate of Canada. He was one of the original members and president of the Royal Society of Canada. The other is D. C. Mackedie, Esq., accountant of the Crown Lands department of this province, who always took great interest in and contributed to the welfare and prosperity of the society.

There have been three hundred and three accessions to the library by donation and purchase during the year, and its usefulness has been fully appreciated by the members.

The new volume of transactions, number twenty, is now in press and will be issued during the coming month. Among other interesting historical matter it will contain the translation, never before published, of the journal of Mr. F. B. Melsheimer, chaplain of the Brunswick dragoons, who came to Quebec in 1776, and also the index of subjects and authors of all of the society's publications.

A meeting of citizens was called by his Worship Mayor Fremont for the purpose of erecting a monument to M. de Champlain, the founder of Quebec. The society being in full sympathy with that worthy object, endorses the action of the committee and congratulates it on the success it has met with, so much so that the erection of the monument will, it is assured, be not long delayed.

The Literary and Historical Society also begs to congratulate the government of Quebec and the Rev. Abbé Casgrain, president of the Royal Society for the zeal and skill which they have exhibited in putting into print the valuable manuscripts in their possession and rendering the contents accessible to the student and investigator of our history. Abbé Casgrain has been indefatigable in his researches in France, and has brought with him a mine of historical wealth relating to Montcalm and DeLévis. The society also observes with pleasure and satisfaction, the progress which our kindred societies throughout the Dominion are making in their several lines of research and enquiry into historical truths.

The election of officers took place at the annual meeting in January last resulting as follows:

President—George Stewart, D.C.L., LL.D., D.Litt., F.R.G.S.
1st Vice-President—William Hossack, Esq.
2nd Vice-President—Very Rev. Dean Norman, D.D., D.C.L.
3rd Vice-President—Cyrille Tessier, Esq.
4th Vice-President—Archibald Campbell, Esq.
Treasurer—Edwin Pope, Esq.
Librarian—Fred. C. Wurtele, Esq.
Recording Secretary—T. Ainslie Young, Esq.
Corresponding Secretary—W. A. Ashe, Esq., F.R.A.S.
Council Secretary—W. C. H. Wood, Esq.
Curator of Museum—Wm. Clint, Esq.
Curator of Apparatus—C. B. Langlois, Esq.

Additional members of the Council:

Peter Johnston, Esq.
J. M. Lemoine, Esq.
P. B. Casgrain, Esq.
Dr. J. M. Harper, F.E.I.S.

W. S. Bennett, Esq., was named auditor.

It was then moved by A. Campbell, Esq., and seconded by W. C. H. Wood, Esq., and carried:—"Inasmuch as there is to be a naval exhibition in England in May next, and inasmuch as the society has in its possession a model of the first steamship that crossed the ocean, built in the port of Quebec, by a Quebec merchant, and modelled by a Quebec ship architect, that such a model must command attention, that the said model be lent for the said exhibition—the patron of which is Our Gracious Majesty—the mover undertaking that the same be returned in due course in the same condition, without any expense to the society."

The model of the steamship Royal William was forwarded to the exhibition committee at Chelsea and duly received, and has attracted considerable attention, thus again bringing Canada and Quebec prominently before the British public.

X.—From *The Pen and Pencil Club of Montreal*, through Dr. S. E. Dawson.

The Pen and Pencil Club of Montreal was formed on the 5th March, 1890, and was incorporated under the law of the Province of Quebec on the 11th November of the same year.

The object of the club is the cultivation and enjoyment of the arts and of letters.

The first officers of the club were:

S. E. Dawson, President.
O. R. Jacobi, Vice President.
J. Try-Davies, Honorary Secretary and Treasurer.

The members are: William Brymner, R.C.A; E. B. Brownlow; S. E. Dawson, Lit. D.; J. Try-Davies; E. Dyonnet; L. Fréchette, LL.D., M.R.S.C.; William Hope; Robert Harris, R.C.A.; Otto R. Jacobi, Pres. R.C.A.; John E. Logan; Paul Lafleur, M.A.; William McLennan, B.C.L.; J. C. Pinhey, R.C.A.; Norman T. Rielle, B.A., B.C.L.; Munsey Seymour; Forbes Torrance; W. C. Van Horne; Percy Woodcock, R.C.A.: Ivan Wotherspoon, Q.C.

At the meetings of the club subjects chosen beforehand are illustrated by original compositions of the members.

Nineteen meetings have been held and the following subjects treated: "A Rainy Day," "The Coffee House," "Remorse," "Saul," "Idleness," "Summer," "Shadow," "Champlain," "Un Début," "The Sea Serpent," "Faith," "Wine," "Immortality," "The Theatre," "Ghosts," "The Street," "Spring," which were illustrated by 49 sketches in oils, 14 sketches in black and white, 2 sketches in pastel, 1 sketch in water colour, 47 compositions in verse, 28 essays and tales in prose.

The membership, which numbers nineteen, is composed of eight professional artists and eleven *littérateurs*, and ability to contribute original work is an indispensable qualification for election to the club.

XI.—From *The Nova Scotia Institute of Science*, through Mr. MAYNARD BOWMAN.

In October last the Institute of Natural Science—for twenty-nine years an incorporated body—ratified by vote the act of incorporation, as well as a change of title, the word "Natural" being eliminated, and thus widening its field of action.

The following papers have been read before the society, and will probably be all published in its 'Transactions:'

1. Notes on the Surface Geology of South-Western Nova Scotia, by Prof. L. W. Bailey, M.A., Ph.D.
2. Experiments made on Stone from Cumberland County, N. S., by N. E. Cooper, Resident Engineer, Bridge Works, Forth.
3. Steam Boiler Tests as a Means of Determining the Calorific Value of Fuels, by D. W. Robb, Esq., Amherst, N. S.
4. The Magdalen Islands, by Rev. G. Patterson, D.D.
5. Poverty Superseded—a New Political Economy, by A. P. Reid, M.A.
6. Contributions to Nova Scotia Botany, Part I, by Prof. G. Lawson, Ph. D., LL.D.
7. Remarks on the Coating of Iron and Steel Articles with Magnetic Oxide, by John Forbes, Esq.
8. Analyses of Nova Scotia Coal and other Minerals, by E. Gilpin, M.A., F.G.S.
9. Railway Construction, by W. B. Mackenzie, Esq.
10. Fertilizers on Sandy Soils, by Prof. H. W. Smith, B.Sc.
11. On the Variation, with Concentration of the Density of Dilute Solutions of Cobalt and Nickel Sulphates, by A. M. Morrison, A.B.
12. A Lecture Experiment, illustrating the Concentration of Solutions, by Prof. McGregor, D.Sc.
13. Pictou Island, by A. H. McKay, B.Sc.
14. Simple Proof of the Completeness of the Differential $\frac{aH}{T}$ in Thermodynamics, by Prof. McGregor, D.Sc.
15. Specific Gravities, etc., of Building Stone supplied by the Chignecto Marine Railway, by H. G. C. Ketchum, Esq.
16. Notes on Some Explosions in the Coal Mines of Nova Scotia, by E. Gilpin, M.A., F.G.S.
17. Notes on Nova Scotian Zoology, No. 2, by H. Piers, Esq.

The exchange list, numbering approximately 260, has been well maintained, a satisfactory increase being perceptible.

The membership, though not largely increased, compares favourably with former years, while a wider interest is being manifested throughout the province and elsewhere.

The following officers were elected:

Prof. McGregor, President.
M. Murphy, C.E., D.C.L., and J. Somers, M.D., Vice-Presidents.
W. C. Silver, Treasurer.
A. H. McKay, Corresponding Secretary.
A. M. McKay, Recording Secretary.
Maynard Bowman, Librarian.

XII.—From *The Montreal Microscopical Society*, through Dr. Girdwood.

The society was originally started by a few microscopists in Montreal about the year 1868 as the Microscopical Club, with the object of promoting microscopical knowledge among its members for practical microscopical work and the interchange of ideas and experiences on microscopical subjects, the meetings being held at the houses of the members, with a limit of numbers to fifteen. For some years the club continued working on these lines, but it has been obliged to enlarge its sphere of usefulness by increasing its numbers, with the increase of the population of the city and the increased number of those interested in the pursuits of the society. We are happy to be able to inform the Royal Society that we now have a membership of fifty-five active members, among whom we have the honour of having the name of his Excellency the Governor-General, Lord Stanley of Preston, enrolled as an honorary member, Sir Wm. Dawson, the Hon. Senator Murphy and numerous scientific gentlemen. Our meetings are now held in the rooms of the Natural History Society. During the past year we had a number of interesting papers read, evoking interesting discussion. A list of these papers is appended, and a list of the officers of the society.

The following meetings of the society were held in 1890-91:

1. Oct. 13—Annual meeting for the election of officers.

   J. Stevenson Brown, President (re-elected).
   Hon. Senator Murphy, Vice-President (re-elected).
   Leslie J. Skelton, Hon. Secretary-Treasurer.

2. Nov. 10—Illumination as applied to the Microscope, by J. Stevenson Brown.
3. Dec. 8—Facts connected with keeping an Aquarium, by the Very Rev. Dean Carmichael.
4. Jan. 12—Practical Hints on Microtomes, by Dr. Wyatt G. Johnson.
5. Feb. 9—Histology of the Eye of the Owl and Compound Eye of the Lobster, by J. W. Stirling, M.D. Edin.
6. March 9—The Microscope and Bacteriology, by Dr. J. A. Beaudry.
7. April 13—The Polariscope as applied in the Separation of Starches, by G. P. Girdwood, M.D., M.R.C.S. Eng.
8. May 12—Bacteria in Montreal Drinking Water, by Dr. Wyatt G. Johnson.

With the meeting of May 12th this session closed, and it is a significant fact that the last meeting was the largest in the history of the society.

Within the last year the membership has more than doubled. There is an active membership of fifty-five, and the rule requiring candidates to be possessors of achromatic microscopes no doubt limits the membership.

XIII.—From *The Manitoba Historical and Scientific Society*, through Dr. Bryce.

The Manitoba Historical and Scientific Society is now in the thirteenth year of its existence, and has during its short history taken notice of many features of the vast territory within the sphere of its work, viz., the country north and west of Lake Superior. Its papers are regularly published, and have now reached 'Transaction 42,' and touch upon the archæology, topography, history, geology and meteorology of the Northwest. The library of the society now contains some ten thousand volumes, including (*a*) a fair collection of Americana, to which considerable additions have been made during the past year; (*b*) the Educational Isbister Library, belonging to the University of Manitoba and at present in charge of the society; (*c*) a respectable collection of reference works; (*d*) a collection of magazines, newspapers and the large scientific and historical exchange list of the society. An arrangement has been made with the city of Winnipeg by which commodious rooms, lighting and heating and attendance, along with a small grant annually for books, are provided. The society continues to enjoy the grant of $250 from the Provincial Government, which is expended entirely on the purchase of books relating to the Northwest. The society is now devoting itself to marking important historical points in and about the city of Winnipeg with suitable memorials. On the 19th June next a monument will be unveiled by the society on the site of the skirmish of Seven Oaks, in which Governor Robert Semple and twenty officers and men of the Selkirk colony were killed by the Metis on the 19th of June, 1816. The funds for the movement have been generously contributed by the Countess of Selkirk, and the land needed has been transferred to the society by the owner, Sheriff Inkster. Steps are being taken for preserving the gateway of Fort Garry, so that some memorial of this great landmark of the past may remain in the land. Efforts are being made to secure for safe-keeping the large collection of documents relating to the early history of Selkirk settlement, now in possession of the Hudson's Bay Company, and which the company is willing to transfer so soon as suitable accommodation can be supplied. The society has a wide sphere for its operations in the Hudson's Bay Company forts, and has many of the officers of this honourable society in its membership; it has the confidence of the people of the Northwest, and its arrangement with the city of Winnipeg guarantees its financial success for the future.

XIV.—From *The Elgin Historical and Scientific Institute*, through Mr. Coyne, President.

The headquarters of the Institute are at St. Thomas, Ontario. The membership, so far, is from the city of St. Thomas and the adjoining townships, but it is hoped that it may be extended so as to include desirable persons from the whole region north of Lake Erie. The Institute was only organized a month ago, and we have therefore no work done to report, except a beginning of the work laid out for itself by the Institute. Some of the early pioneers of the Talbot settlement are still living. We have already had the reminiscences of several of these recorded, for the benefit of the future historian.

We have caused a regular surveyor's plan to be made for the Canadian Institute of the Southwold Indian earthworks described in Mr. Boyle's last report, and have examined the fort itself and some middens, with the result that we have already the beginning of what we expect will be in the course of time a fair archæological museum. We purpose collecting and preserving specimens of the fauna and flora of the district, and devoting ourselves as far as practicable to scientific and historical investigation generally.

XV.—From *The Canadian Institute*, through Mr. ALAN MACDOUGALL, M. Can. Soc. C.E., M. Inst. C.E.

The Canadian Institute has completed its 42nd year; the interest in the work of the Institute increases, the meetings are well attended, the supply of papers well maintained with a marked growth of original investigation. The session extends from November to May. There were 24 meetings of the Institute and 24 of the sections, at which 58 papers, altogether, were read. A list of these with the author's names and also a list classified under their subjects will be found in the appendix.

The membership increases, although the gross number of members is the same as it was two years ago; this is due to the rigid enforcement by the Council of the regulations referring to non-payment of fees. There are 254 members and 17 associates; 37 new members were elected; the losses by death, resignations and erased names amount to 28.

The income from all sources was $2,771.45, the expenditure $2,060.72, leaving a balance in favour of the Institute of $710.73. In addition to this the Institute received from the provincial government $1,000, for archæological purposes.

The assets, which include the lot, buildings, library, museum, are valued at $29,000, the liabilities are two mortgages amounting to $4,000, leaving a balance in favour of the Institute of $25,000.

The Institute has watched closely the steps taken to extend the use of the cosmic system of time reckoning. Noticing that the circulars of Lord Knutsford of date 26th July and 21st November, 1890, were addressed only to the colonies and dependencies of the British Empire, it directed the attention of His Excellency the Governor-General to this, and respectfully submitted that he direct the attention of foreign governments to this important movement, which he agreed to do.

A mining convention was held in Toronto on the 31st March and two succeeding days, at the invitation of the Institute; there was a full attendance of persons interested in mining matters. The convention adopted the resolutions submitted by the Institute relating to the establishment of a Provincial Mineralogical Museum, of a properly equipped school of mines, and the appointment of a departmental head for mining matters.

The convention before it separated had several interviews with the government of the province of Ontario, and was instrumental in obtaining the passage of an act regulating mining in this province.

The Institute desires to draw attention to the great importance of prosecuting historical research. During the past year, papers of considerable interest and value have been read before the Institute. Special mention may be made of contributions on this subject, by Messrs. D. B. Read, Q. C.; W. Houston, M.A.; J. C. Hamilton, LL.B.; W. Canniff, M.D., M.R.C.S.; Capt. E. Cruikshank; J. D. Ridout, Esq.; D. Boyle, Esq.; Miss Carnochan, and by Lt. Cols. R. Z. Rogers and G. T. Denison and Capt. Cruikshank before the Canadian Military Institute; also to the lately published work on historical documents by Mr. W. Houston.

A deputation from the historical section had an interview with the government and at the request of Honourable Attorney General Mowat, the Institute prepared and presented a memorial on "historical documents deserving the attention of the administration of the province of Ontario with a "view to their publication" which it has strong hopes to believe will be favourably considered by the government.

If the co-operation of our kindred societies in the various provinces can be enlisted in this important subject, a large number of valuable documents will be spared to the country and material preserved which will be of inestimable value to future students and historians; concerted action by the Royal Society and those societies affiliated to it will materially influence the several provincial governments to grant aid for this purpose.

A growing interest has been awakened in archæological work by the publication of the curator's reports, which have appeared as appendixes to that of the Honourable Minister of Education. A large number of presents have been received and many interesting collections purchased. The

collection in the museum of the Institute draws forth unlimited praise and admiration from all archæologists who visit it.

The summer convention held at Niagara last July was a decided success, much local interest was taken in it; several invitations have been received for this year. The Institute has accepted that of the town of Penetanguishine, round which cluster historical memories even more interesting than those of our last year's meeting place. The Institute extends an invitation to the Royal Society to take part in the coming convention.

Two years ago, a memorial was presented to the Ontario government praying that a tract of land be set apart to form a national park or reservation, for the preservation of wild animals and the forest. Owing to the death of Hon. Mr. Pardee no action was taken. The Institute notices with pleasure that the subject was mentioned in the closing days of the legislature by the Hon. Mr. Hardy just after the annual meeting of the Institute had been held. This matter will again engage the attention of the Institute.

The Institute was ably represented at the congress on Romance languages held in Montpellier, France, last May, and at the Jamaica exhibition, by Mr. Arthur Harvey, now its president.

The biological section has now sub-sections in microscopy, ornithology and botany. The first, only lately formed, has organized into good working order; the second has made a good record for itself, as the report in vol. 1, part 1 of the new series will show, and the third is probably the most active; only a year old, it has already collected and identified 389 species of plants, 325 of which were found in the vicinity of Toronto. It is gratifying to find much interest taken in this section by the associates, nearly all of whom belong to it and are young lads merging into manhood. There were 14 meetings and 15 papers.

The geological and mining section points to the mining convention as the crowning work of its session. There were 4 meetings and 4 papers.

The historical section formed in the spring of 1890, arranged for and carried out the Niagara convention, and last session took a deep interest in promoting the objects for which it was specially organized.

The librarian reports accessions to the library. Purchases, 834; donations, 390, and exchanges, 3,700.

The Institute exchanges its transactions with 516 societies, periodicals and others, by which means it is building up a library of great scientific value.

The publication of the new series under the title of "Transactions of the Canadian Institute" has been very favourably received. It is gratifying to notice frequent reference to our proceedings as well as to find many papers mentioned and translated into the proceedings of foreign exchanges.

The Institute takes pleasure in acknowledging the generosity of the Ontario government in placing $1,000 at its disposal for archæological purposes, and tenders its thanks for contributions to both museum and library, to numerous friends in Ontario and other parts of the Dominion, and to its distinguished hon. member, Sandford Fleming, LL.D., C.M.G., F.R.S.C., for his late gift to it.

The following is a classified list of papers presented to the Institute:—

Anthropology	3	History	3
Archaeology	1	Jurisprudence	1
Astronomy	1	Literature	1
Biography	1	Metallurgy	1
Biology	3	Mineralogy	2
Chemistry	1	Miscellaneous	1
Economics	3	Philology	3
Fine Arts	3	Sanitary Science	2
Geography	1	Zoology	2

Total 33 papers.

List of meetings, session 1890-91.

1890.

November 1. The Canadian Institute of the future, D. Boyle.
8. The two values, W. A. Douglas, B. A.
15. Studies in cell structure and cell contents, A. B. MacAllum, B.A., M.B.
22. The typhoid bacillus in relation to drinking waters, J. J. Mackenzie, B.A.
29. Occurrence of gold and silver in galena and iron pyrites, R. Dewar.

December 6. Reminiscences of Newfoundland, Rev. P. Tocque, M.A.
13. Report of delegate to the Montpellier congress on Romance Tongues with remarks on some ancient races still existing in southern Europe, their languages and customs, A. Harvey.
20. Sculpture, F. A. Dunbar.

1891.

January 10. Colour in nature (in relation to drapery), W. A. Sherwood.
17. Studies in the origin of the blood pigment, A. B. MacAllum, M.B., Ph.B.
24. African and American; the contact of the Negro and the Indian, A. F. Chamberlain, M.A.
31. Canadian Art of to-day, J. W. L. Forster.

February 7. Some effects of Christianity in legislation, Hon. W. Proudfoot.
14. The Boœthick Indians of Newfoundland, A. Macdougall.
Crystal studies (Nos. 2 and 3), H. R. Wood, M.A.
21. Review of a work by A. W. Moore, M.A., on surnames and place names of the Isle of Man, Rev. N. MacNish, LL.D.
28. Codification of the law (3rd paper, contracts), T. B. Browning, M.A.

March 7. A consideration of sewage schemes, L. J. Clark.
A few words on lake currents, L. J. Clark.
14. Indian remains and relics found in neighborhood of Balsam Lake, G. E. Laidlaw.
21. Notes on French Canadian folk lore, A. F. Chamberlain, M.A.
Reforms in time reckoning, Sandford Fleming, LL.D., C.M.G.
28. Some points in milk analysis, W. H. Ellis, M.B., M.A.
The administration of Gov. Simcoe, Capt. E. A. Cruikshank.

April 4. Miss Dix and her life work, E. A. Meredith, LL.D.
Modern Ornithology, W. Brodie.
11. Japanese Literature, Tozo Ohno.
18. The study of history, Rev. G. Wrong, M.A.
The genesis and growth of capital, W. Houston, M.A.
25. A Gaelic cuneiform inscription, Rev. N. MacNish, LL.D.
British and Canadian trade relations, J. C. Hopkins.
Intelligence of insects as exemplified by *Pelopeous cementarius*, W. Brodie.

Biological Section.

Chairman, J. H. Pearce—Secretary, C. W. Armstrong.

1. Chairman's Address, J. H. Pearce.
2. Accumulation of drift wood by the river Don, W. Brodie.
3. Notes on Ontario birds (cont'd), G. Atkinson.
4. Review of work done by the botanical sub-section, C. W. Armstrong.
5. Ferns round Toronto, C. W. Armstrong.
6. Notes on hybrids, W. Cross.

7. Objects of the study of ornithology, W. Brodie.
8. Ornithological report, G. Atkinson.
9. Habits of native birds in captivity, G. Atkinson.
10. Bone-caves of Europe in relation to pre-historic man, A. Harvey.
11. Art of taxidermy, W. Cross.
12. Ginseng, its medicinal properties and commercial value, J. H. Pearce.
13. Lower forms of life, A. Elvins.
14. Technical etymology, J. H. Pearce.
15. *Herpestes griseus* in Jamaica, A. Harvey.

Geological and Mining Section.

Chairman, W. Hamilton Merritt, F.G.S.—Secretary, G. Mickle, B.A.

1. Notes on production of iron and steel in Ontario, W. H. Merritt, F.G.S.
2. Progress of mining legislation in Ontario, W. H. Merritt, F.G.S.
3. History and occurrence of nickel, G. Mickle, B. A.
4. Nickel assaying, G. Mickle, B.A.

Historical Section.

Chairman, J. C. Hamilton, LL.B.—Secretary, A. Harvey.

1. An account of his captivity among the Shawnees in 1788, written by the late Hon. Thos. Ridout, Surveyor General of Canada, J. G. Ridout.
2. On the development of legislative autonomy in Canada, Wm. Houston, M.A.
3. On Afro-Canadian incidents and the career of John Brown in Canada, J. C. Hamilton, LL.B.
4. Incidents in the life of General Brock, D. B. Read, Q.C.
5. On the campaign of 1815 (Waterloo), J. G. Ridout.
6. A transcript, with illustrative maps and comments, from the diary of Mr. Alex. Macdonell who had accompanied Governor Simcoe in an expedition from the Humber Bay to the Georgian Bay by way of Lake Simcoe, in 1793, W. Houston, M.A.

Report of the Librarian:

Purchases	834
Donations	390
Exchanges	3700

Of the above donations 151 were presented by Mrs. Seidler and 61 by the late Hugh Wilson, Esq., D.L.S.

Distribution.

I. Number of societies, individuals and periodicals to which the publications of the Institute are sent, 516.
II. Reading Room. Periodicals subscribed for, 36.
III. Total of separate numbers received by purchase, 834.
IV. Number of books and periodicals taken out, 1551.

Exchanges.

Canada	200	Portugal	16
United States	800	Russia	42

Mexico, West Indies and S. America	73	Spain	27
Great Britain and Ireland	473	Sweden	24
Austria-Hungary	145	Switzerland	24
Belgium	18	British India	68
Denmark	5	Java	28
France	572	China	4
Germany	901	Japan	24
Italy	177	Cochin China	2
Netherlands	36	Africa	5
Norway	16	Australasia	20

Total exchanges, 3,700.

OFFICERS OF CANADIAN INSTITUTE, 1890-91.

President—C. Carpmael, M.A., F.R S.C.
Vice-President—James H. Pearce.
Secretary—Alan Macdougall, M. Inst., C.E.
Treasurer—James Bain, jr.
Librarian—A. F. Chamberlain, M.A.. succeeded by D. R. Keys, M.A.
Curator—David Boyle.
Editor—George Kennedy, M.A., LL.D.

Members of Council.

W. E. Middleton, Secretary, biological section.
W. H. Merritt, F.G.S., Chairman, geological and mining section.
J. C. Hamilton, LL.B., Chairman, historical section.
W. H. Vander Smissen, M.A.
W. H. Ellis, M.A., M.B.
Arthur Harvey.
Maurice Hutton, M,A.

XVI.—From *The Society of Canadian Literature, of Montreal*, through Messrs. GEORGE MARTIN and A. WEIR.

This society was established in 1889, with John Reade, Esq., M.A., F.R.S.C., as president, the late lamented John Talon-Lesperance, Esq., F.R.S.C., vice-president, and Arthur Weir, Esq., B.A.Sc., secretary; and its purpose, as set forth in its first circular, is "an examination of our national literature, English and French, the acquirement and diffusion of a knowledge of our best poetry, romance, historic works and other writings, the provision of a centre for local literary life and for the introduction of visiting *littérateurs*, and the encouragement of all proper literary works and movements throughout the country."

Forty-two members were enrolled on the evening of the first meeting, and the number has not decreased since that date.

On November 30th of the same year it was decided to hold meetings conjointly with the Society for Historical Studies, our work being similar and overlapping in some instances, and the arrangement has resulted very satisfactorily.

During the season of 1889-90 ten papers were on the published programme, and many new facts concerning early Canadian literature were made known.

The season of 1890-91 was opened by a regular public meeting, which was largely attended. Mr. Neil Warner, the well-known elocutionist, read selections from the works of Geo. Murray, Esq., B.A., F.R.S.C., which were warmly received, Mr. Warner lending to the charm of the poet the music of his voice.

On December 18th another successful public meeting was held, at which W. D. Lighthall, Esq., M.A., B.C.L., read a paper on "Some Canadian Literary Cranks," remarking upon the folly of hypercriticism as well as of undue praise.

On the 15th of January E. B. Brownlow, Esq., better known as "Sarepta," read a paper upon the lines of that of Mr. Lighthall, but from a somewhat different standpoint.

On February 10th another meeting was held, at which Robert Harris, Esq., R.C.A., delivered an instructive and interesting paper entitled "Notes on Early Canadian Artists."

The following have been elected honorary members of the society: Wm. Kirby, Esq., Prof. C. G. D. Roberts, Chas. Sangster, Wm. Kingsford, Mrs. S. F. W. Harrison, Miss A. H. Machar, Chas. Mair, late Hon. P. J. O. Chauveau, Lieut.-Col. J. H. Duvar, Alex. McLachlan, Lord Lorne, G. W. Wicksteed, Rev. E. McD. Dawson, Rev. W. H. Withrow, N. F. Davin, M.P., Francis Parkman, Dr. J. G. Bourinot, H. J. Morgan, J. M. LeMoine, Louis Frechette, Arthur Weir, Col. Sir W. F. Butler.

XVII.—From *The Natural History Society of Montreal*, through Very Rev. James Carmichael, Dean of Montreal.

The influence of the society is exercised through the benefits of a museum and library, the publication of the 'Canadian Record of Science,' the reading of papers at monthly meetings containing original observations and investigations, and the delivery of a course of free scientific lectures on scientific subjects, known as the Somerville Course.

For nearly two years the museum has been undergoing re-arrangement under the direction of Mr. J. Stevenson Brown, the honorary curator. Mr. Horace T. Martin has re-arranged and re-classified the mammalian department, Mr. Caulfield the ornithological, Mr. Winn the entomological; Mr. E. H. Hamilton has re-classified, and indeed almost transformed, the mineral department; Messrs. J. Stevenson Brown, J. S. Shearer and E. T. Chambers, ably assisted by Mr. Alfred Griffin, our valued superintendent, have re-arranged the fossils, conchological collection, and the department of Indian Eskimo and Mexican antiquities. It is much to the credit of the society that all this work has been most willingly and efficiently done by its own members. During these alterations the museum was closed for several months, necessarily interfering with the attendance of the public, but since re-opening the attendance has been good, especially on the part of city schools and classes, and on the free nights in connection with the Somerville lectures.

The library, under the management of Mr. T. E. Chambers and containing upwards of 3,000 volumes, has undergone careful revision and re-arrangement during this year, and a good work has been done in binding a quantity of valuable material and placing the bound volumes on the shelves. This library is open to the members of the society.

The 'Canadian Record of Science,' a valuable quarterly dealing with the proceedings of the society, and edited by an able committee, of which Prof. Penhallow has been chairman, not only gives to original papers a wider dissemination than they would otherwise obtain, but keeps the society in touch with the larger world of science as a valuable exchange. This 'Quarterly,' which has replaced the older 'Canadian Naturalist,' reflects much credit on the gentlemen forming the editing committee, and through them on the society itself, of which they have long been prominent and distinguished members.

Judging by the success of the last annual field day, held in Lachute on the 7th of June, 1890, and joined in by representatives of other Montreal societies and a delegation from Ottawa, it is plain that

such days are in every way useful to the society itself. They bring the members and more prominent spirits of the association together in friendly intercourse; they create a spirit of enquiry in the neighbourhood in which they are held as to the work of the society itself; they draw out the tastes of younger members in competing for prizes, geological, entomological, botanical, etc.; they furnish valuable instruction through the chairmen of the different branches into which the society breaks itself up during the day, and they leave a general impression of scientific pleasure behind them in the minds of all fortunate enough to take part in them. In every way the Lachute field day was a decideds uccess, reflecting the greatest credit on those gentlemen who undertook its management.

At the monthly meetings of the society the following papers containing original investigations and observations were read and received the criticism of the members:

1. On the Clay Concretions of the Connecticut River, by Miss Arms, read by Sir Wm. Dawson.
2. Note on a peculiar Growth in a Black Walnut, by Prof. Penhallow.
3. On Caterpillar Fungus from New Zealand, by Prof. Penhallow.
4. Notes on Soil Temperatures taken by Prof. Penhallow, Prof. McLeod and Mr. E. H. Hamilton, by Prof. Penhallow.
5. Canadian Argol or Crude Cream of Tartar, by Prof. J. T. Donald.
6. Composition of the Oil used and the Pig Iron produced at the Radnor Forges, by Prof. J. T. Donald.
7. Some Interesting Fishes from the Lower St. Lawrence, by Sir Wm. Dawson.
8. A Form of Apparatus for collecting traces of suspended matter in drinking water, by Dr. R. F. Ruttan.
9. Wild Flowers of Great Britain in July and August, by Rev. Dr. Campbell.
10. Our present knowledge of the Projection of Sound in Space by the Human Ear, by Dr. J. W. Sterling.

The object of the Somerville Course of free lectures is that of bringing before the public in a more popular manner than that of technical papers various scientific subjects likely to prove of general interest. The last course was in no way less interesting than former ones, and, judging by the willing attendance of the public, was fully appreciated. The course was as follows:

A Popular Talk about Birds, by J. M. LeMoine, Esq., Quebec.
Ants—a Home Study, by Very Rev. Dean Carmichael.
The Squid and its Relations, by Sir Wm. Dawson.
Coral Animals, by Mr. F. D. Adams.
Domestic Pets, by Prof. C. McEachran.
Poultry, by Dr. T. Wesley Mills.

During the year sixteen new members have been added to the society, making the total of the membership 222.

During the year thirty-four valuable donations have been made to the society, mainly ornithological.

In making this report to the Royal Society of Canada, the Natural History Society of Montreal would desire to tender its renewed allegiance to an organization, which bears not only the stamp of royal favour on it, but which it is hoped will in time do for Canada what the kindred associations have done for Britain. We tender our renewed allegiance with a spirit of willing loyalty, and we add to our allegiance a hearty welcome and a sincere wish that your visit to the commercial metropolis of Canada may in every way be useful to the city and yourselves.

XVIII.—From *The Numismatic and Antiquarian Society of Montreal*, through Mr. Justice BABY.

Since our last report the Numismatic and Antiquarian Society of Montreal has been in a fairly prosperous condition, which has enabled it to carry on with success the works for which it has laboured since its inception. The publication of its journal, 'The Antiquarian,' having been resumed, notwithstanding the withdrawal by the Quebec Government of the very small subsidy granted, $100, the society has thus been enabled to better further the intentions of its founders. By and through this quarterly magazine, now in its fourteenth volume, many valuable documents have been exhumed, as it were, which, with proper commentaries, have sometimes thrown considerable new light on what hitherto had been rather difficult for the student to explain, historically speaking.

Among the divers subjects which have particularly engaged our attention and consideration I may be allowed to state the following:

Through our repeated efforts the public has been seized with a project by which will be preserved and continued in Montreal the souvenirs of its early history—a project which is on the eve of being realized, I am happy to say. Thus, with the active co-operation of several generous citizens, the society has succeeded in finding the means of perpetuating, as done in many cities of both the old and new worlds, the principal events of the old past, as well as the names of the men and heroes who took an active part therein; also in indicating the landmarks, which unfortunately are so fast disappearing from our midst. In the course of a few months, if not weeks, a number of marble tablets will have been placed where long and active researches indicate they should be put up for the proper information of all those who take an interest in historical matters, and particularly so for the enlightened stranger who visits our fair city.

The project of preserving from certain destruction that historical building called the "Château de Ramezay" also originated with us, and we are most grateful to your society for the considerable interest you have manifested in that direction, as appears by the valuable report made by Mr. Bourinot, your distinguished secretary, at the opening of this your annual meeting. No doubt this expression on your part in favour of the project will have its proper weight in the quarters where it is the most needed.

The celebration of the 250th anniversary of the foundation of Montreal, next year, has also been taken up by our members, and as far back as last year resolutions were passed in view of furthering the same as much as lay in them in connection with the citizens of all creeds and nationalities of Ville Marie, as named by Paul Chomedey de Maisonneuve, its founder. A monument to this distinguished man—the representative of Messrs. Olier and de la Dauversière—it has been resolved to erect on this auspicious occasion on the Place d'Armes, and the society has taken such steps as it could to ensure to this so long delayed token of respect and gratitude the proper historical character it should bear.

It will be seen, Mr. President, from the above that we have not remained idle, and that all and one the members of this society have done everything in their power to promote and foster the taste for historical researches and studies in the Canadian dominion, and acted, at the same time, undoubtedly the part of good citizens, which we claim.

In conclusion, let me state that if, on the one hand, our members have increased in numbers, on the other we have suffered, by the hand of death, some very heavy losses; among others, one of our most distinguished presidents, who was also at one time your worthy predecessor in this chair. I have named the Hon. Mr. Chauveau, whose eulogium need not be made here, I am certain.

XIX.—From *The Natural History Society of British Columbia*, through Dr. C. M. NEWCOMBE.

The Natural History Society of British Columbia was founded in April, 1890, with headquarters at the Provincial Museum, Victoria, with the object of studying the natural history of British Columbia and of rendering independent aid to the Provincial Museum.

During the year ending March 31st, 1891, upwards of fifty members paid fees—$5 each for members living in or near Victoria, and $2.50 if living elsewhere in the province.

About $240 have thus been collected, and $140 have been spent, mostly in the purchase of books.

Large donations of books and reports have been received from the Geological Survey of Canada, from the Royal Society of Canada, the Smithsonian Institution, and from gentlemen interested in the natural history of British Columbia, notably Dr. G. M. Dawson, Mr. Macoun, Mr. Whiteaves, and Prof. J. J. Smith, of Yale.

Evening meetings have been held fortnightly during the year, when papers were read and various specimens examined before presentation to the museum.

Most of the papers were upon the local natural history, and included the following subjects:

1. The Salmonidæ of British Columbia.
2. The Economic Fishes of British Columbia.
3. The Birds of British Columbia and their Distribution.
4. The Deer of British Columbia and their Distribution.
5. The Bears of British Columbia.
6. The Crabs of the South-east Coast of Vancouver Island.
7. The Jade Implements of British Columbia.
8. The Crania of certain Indian Tribes of British Columbia.
9. Haidah Legends.
10. The Economic Minerals of New Caledonia.
11. The Topography and Resources of the Queen Charlotte Islands.
12. The Preservation of the Indian Remains of British Columbia.
13. Leaves and their Functions.
14. The Study of Entomology.
15. Birds and their Place in Nature.

Field meetings were held fortnightly when weather permitted, and visits were made to many places in the neighbourhood of Victoria.

1. To Cadboro' Bay, interesting for its land and marine fauna and flora, and also for its Indian fortifications, shell mounds and burial cairns.

2. To Macaulay's Point, where Indian remains also abound, and where glacial groovings and boulders are very plentiful.

3. To Mount Finlayson, with a sub-arctic flora near its summit.

4. To Shawnigan Lake, where *Lobelia Dortmanna*, *Sisyrinchium Californicum* and other plants not noted elsewhere in the province were collected.

5. To Beaver Lake, abounding in fresh water shells.

Several dredging expeditions were most popular, and enriched the Provincial Museum with numerous specimens of marine invertebrata.

One hundred dollars of the society's funds have been appropriated in aid of publishing an account of the work of the year, and some of the principal papers read will be printed in full. A preliminary check list of the birds of British Columbia will also be added.

Copies of the 'Transactions' will be sent to those societies and individuals who have so kindly assisted in the formation of the youngest provincial natural history society in the Dominion.

XX.—From *The Société Historique de Montréal*, by Mr. Justice Baby.

La Société Historique de Montréal a été fondée au mois d'avril 1859 par MM. le commandeur

Viger, R. Bellemare, J. U. Beaudry, mort, juge de la Cour Supérieure, et G. Baby, auxquels se joignirent bientôt MM. Huguet-Latour et L. H. Lafontaine.

Mais nous devons regarder comme son principal fondateur M. Viger, notre maître à tous — dont les recherches et les publications historiques remontaient au commencement du siècle.

Elle se compose de soixante membres actifs et de dix membres correspondants, presque tous de pays étrangers.

Les progrès ont été lents d'abord ; il y avait bien alors un réveil des études historiques sur le Canada ; les abbés Ferland et Laverdière, que nous eûmes bientôt l'honneur de compter parmi nos membres, donnaient l'impulsion par des travaux qui resteront ; mais le nombre de ceux qui croyaient à la nécessité de l'exactitude des faits et des dates était bien restreint ; de plus, nous n'avions pour nos recherches d'autre bibliothèque et d'autres documents que ce qui avait été mis à notre disposition par notre fondateur.

Les choses ont heureusement changé depuis cette époque : les bibliothèques particulières se forment et s'enrichissent ; on sent partout une émulation salutaire, et ceux qui publient des travaux historiques sont assurés d'avance de trouver des lecteurs empressés et intelligents.

Ce ne fut qu'après la mort de M. Viger que notre Société donna au public le premier de ses mémoires ; elle avait choisi un travail intéressant sur l'existence de l'esclavage au Canada, fait que tout le monde semblait alors ignorer.

Depuis, la Société Historique a continué ses publications, sans en faire cependant l'objet unique de ses travaux.

Des fonds que le gouvernement de Québec a mis à sa disposition, elle a fait deux parts. Avec la première, elle a acheté et fait copier des documents ; avec la seconde, elle a fait imprimer dix volumes plus ou moins considérables. Le dernier volume, annoncé depuis longtemps, n'a pas encore été distribué, par suite de circonstances incontrôlables ; mais il le sera bientôt.

Si nos publications ont été peu nombreuses, elles paraissent, en revanche, avoir pris une certaine valeur documentaire aux yeux de ceux qui étudient notre histoire, par suite du soin avec lequel elles ont été préparées.

D'un autre côté, nous continuons nos bons rapports et nos échanges avec des sociétés sœurs de France et des Etats-Unis ; notre bibliothèque se développe aussi graduellement par des dons de livres et de manuscrits ; nous avons pu y ajouter un certain nombre de cartes anciennes du Canada, que nous avons fait copier.

Bientôt — nous l'espérons — par l'entremise d'un ami, nous pourrons obtenir des analyses et des extraits de certains documents concernant le Canada, qui se trouvent à Saint-Petersbourg. Nous y avons déjà fait copier un mémoire intéressant sur l'époque de la conquête.

La Société Historique constate avec plaisir que plusieurs des suggestions qu'elle avait eu l'honneur de faire, soit dans ses publications, soit dans ses rapports, ont été réalisées ou le seront bientôt. Ainsi le gouvernement de Québec continue l'impression des minutes du Conseil Supérieur ; il est question de rappeler la fondation de Montréal par des tables de marbre. Le gouvernement fédéral, après avoir fait analyser un grand nombre de pièces au ministère de la Marine et ailleurs, fait copier les plus importantes.

A cette occasion la Société Historique exprime humblement le désir que les copies, et toutes celles qui peuvent être faites ailleurs, soient revues soigneusement, collationnées avec la plus scrupuleuse exactitude, qu'elles soient rendues en *fac simile* pour ainsi dire, et ensuite authentiquées par des personnes compétentes. Ce n'est qu'à cette condition que des copies sont véritablement utiles.

Enfin la Société Historique de Montréal, par l'entremise de la Société Royale, demande aux autres sociétés historiques, s'il ne serait pas utile de s'unir pour établir des principes, pour indiquer des vues d'après lesquelles les différentes provinces pourraient se guider pour le choix et la publication des parties les plus importantes des anciennes pièces officielles.

Le tout humblement soumis.

Montréal, 27 mai 1891.

At the request of the President the following distinguished gentlemen addressed the Royal Society, and gave a brief account of the work of the respective bodies represented by them: Major Powell, director of the Geological Survey, Washington; Mr. Prescott, of Ann Arbor University; Mr. Williams, of the Minnesota State Historical Society of St. Paul, and Gen. Francis A. Walker.

Dr. Alex. Johnson, of the Committee on Tidal Observations in Canada, reported as follows:

"The Committee on Tidal Observations in Canada beg to report that a satisfactory beginning has been made in the establishment of stations for observations, but the work is too recent for any special report to be made. They would suggest the reappointment of the committee.

A. Johnson,
Secretary.

"May 28th, 1891."

The report was adopted and the meeting adjourned.

The Evening Proceedings.

In the evening a public lecture was delivered in the Queen's Hall by Prof. McGregor. There was a large attendance, including all the members of the Royal Society at present in the city, the associate members, the delegates, the members of the Natural History Society, their lady friends, etc. Rev. Abbé Laflamme presided. At the close Principal Grant proposed a vote of thanks to the lecturer, which was heartily accorded.

Mayor McShane's reception at the City Hall was the next proceeding on the programme. The corridors of the civic palace and the interior of the Council chamber were beautifully decorated with flowers and plants. A band played a number of pieces during the evening. Besides the members of the Royal Society and of the Natural History Society there were also present Sir Donald Smith, Sir Joseph Hickson, Consul-General Knapp, Aldermen Rolland, Gauthier, Stevenson, Lamarche, Robert and Shorey. Having partaken of refreshments in the Mayor's apartments, speeches laudatory of Mayor McShane's "munificent hospitality," as the president of the Royal Society termed it, were delivered by Principal Grant, Sir Donald Smith, Sir Joseph Hickson, Mr. Sandford Fleming, Mr. Sulte, Mr. Justice Wurtele, Rev. J. Barclay, Rev. J. H. Dixon, Consul-General Knapp, Prof. Parker and Ald. Rolland. The company separated after singing "God Save the Queen."

SESSION III—(*May 29th.*)

The Society met in the William Molson Hall on Friday, May 29th. The president, Very Rev. Principal Grant, D.D., took the chair at 10.15 a.m. o'clock, and called the members to order.

Col. Denison read the following telegram from the Clerk of the City Council of Toronto, inviting the society to the city of Toronto next year:

Toronto, May 28th, 1891.

Col. G. T. Denison, care of Royal Society of Canada.

The City Council, by resolution, extend a most cordial invitation to the members of the Royal Society of Canada to hold their next annual meeting in this city.

Kindly notify this society of the above.

John Blevins.

On motion of Mgr. Hamel, seconded by Dr. S. Fleming, the invitation was referred to the Council, with a recommendation to accept it.

The following communication was received from the Fourth Section:

MONTREAL, May 29th, 1891.

To the President of the Royal Society of Canada, Montreal.

SIR,—I have the honour to inform you that at the afternoon session of Section IV, Prof. J. Fowler, of Queen's University, was unanimously elected a fellow of that section of the society, to fill the special vacancy created last year by the decision of the council to increase the section to twenty-five members, at the rate of one new member each year until that number is reached. I send this notice on learning that our secretary has not so far notified you to this effect.

JAMES FLETCHER.
JOHN MACOUN.
GEORGE M. DAWSON.

On motion of Dr. Stewart, seconded by W. Saunders, the election of Prof. James Fowler as a fellow of this society was ratified.

At the request of the President, short addresses were delivered by Dr. Barker, of Pennsylvania, and Mr. Page Wood, of Philadelphia.

The consideration of the recommendation of the Council regarding the election of new members was postponed until the afternoon.

On motion of Sir W. Dawson, seconded by Dr. S. Fleming, Rev. Abbé Laflamme was elected President of the Royal Society.

On motion of Mgr. Hamel, seconded by Dr. Stewart, Dr. J. G. Bourinot, C.M.G., was elected Vice-President.

On motion of Dr. Girdwood, seconded by Dr. Selwyn, Mr. G. C. Hoffmann was elected Honorary Secretary.

On motion of Dr. Stewart, seconded by Dr. Johnson, Dr. Selwyn, C.M.G., was elected Honorary Treasurer.

The following resolutions were unanimously agreed to:

(1.) "*Resolved*, That the report of the council and the minutes of the present general meeting be printed as soon as possible by the honorary secretary for the information of members." (On motion of Dr. Stewart, seconded by Mr. Evan MacColl.)

(2.) "*Resolved*, That the members of the Royal Society of Canada express their appreciation of the very handsome and hospitable reception accorded to them by the Mayor and City Council of Montreal." (On motion of Dr. Sandford Fleming, seconded by Mr. C. Carpmael.)

(3.) "*Resolved*, That the members of the Royal Society of Canada tender their thanks to the president, officers and members of the Citizens' Committee, under whose auspices the very complete and satisfactory arrangements for the meeting in Montreal have been carried out." (On motion of Dr. Selwyn, seconded by Mr. Gisborne.)

(4.) "*Resolved*, That the members of the Royal Society of Canada tender their thanks to the authorities of McGill University for their courtesy in providing rooms for the meetings of the society and its sections and for other facilities. (On motion of Mgr. Hamel, seconded by Mr. Whiteaves.)

(5.) "*Resolved*, That the members of the Royal Society of Canada again cordially thank the Natural History Society of Montreal for their invitation, in consequence of which the present very successful meeting in Montreal has been held." (On motion of Dr. Stewart, seconded by Col. Denison.)

(6.) "*Resolved*, That the members of the Royal Society of Canada express their grateful appreciation of the hospitalities shown them by his Worship the Mayor, the Harbour Commissioners of Montreal, the Art Association of Montreal, by Hon. Senator Drummond and the other citizens." (On motion of Mgr. Hamel, seconded by Col. Denison.)

(7.) "*Resolved*, That the members of the Royal Society of Canada tender their thanks to the Canadian Pacific Railway, Grand Trunk Railway and Intercolonial Railway for the special rates accorded to those attending this meeting from a distance." (On motion of Mr. Whiteaves, seconded by Dr. Fréchette.)

(8.) "*Resolved*, That the thanks of the society be accorded to Dr. George Stewart for his efficient performance of the duties of secretary during the meeting in the absence of the honorary secretary, Dr. Bourinot." (On motion of Mr. Carpmael, seconded by Dr. G. M. Dawson.)

(9.) "*Resolved*, That the Royal Society expresses its gratification that so many representatives of literature and science have attended from the United States, and given its meetings the benefit of their advice and sympathy."

The following communication was read to the meeting:

78 Union Avenue, 29th May, 1891.

Rev. Geo. M. Grant, D.D., President of the Royal Society.

Dear Sir,—The chairman of the Fire Committee would be much pleased to have an opportunity of showing the working of the fire department to the members of the Royal Society.

Would it be possible to meet him (Col. Stevenson) at say 4 o'clock this afternoon in front of the Windsor?

The colonel will be in the City Hall from 10 o'clock until noon, and if you can meet him at 4 or such other hour as may suit you, he will give the necessary instructions.

Please give your answer to Mr. Beaudry, the local secretary, and tell him to telephone me at the Court House and to Col. Stevenson at the City Hall.

Yours truly,

J. Wurtele.

The foregoing invitation was declined with regret, owing to want of time.

Dr. Sandford Fleming read the following special report from Section III:

Report.

The Time Nomenclature Committee has considered the question referred to it respecting the "unit of time" and the "hour meridians," and begs leave to report:

The Unit of Time.

The unit of measurement, as stated in the address of the President last year (extract appended), is the basis of the new system of universal time reckoning. It is determined by the resolutions of the International Conference held at Washington in 1884, when twenty-four nations were represented. So far it is without an appropriate name, and the Royal Society has taken the initiative in an endeavour to supply the requirement. As a result of the action taken by the society last year, the following compounded words have been submitted:

1. Chronocanon (the time standard).
2. Chronomonad (the time unit).
3. Cosmochron (the world time).
4. Cosmognome (the world dial or style).
5. Heliomonad (the sun unit).
6. Metremer (the measuring day).
7. Metrochron (the measuring time).
8. Monochron (the unit of time).
9. Nomochron (the law or standard of time).
10. Pantochron (universal time).

Two short words have likewise been proposed, to which the committee desires to direct special attention.

The first, "Heliad," derived from *helios* (the sun), is thought by some gentlemen to be "sufficiently self-interpreting, and no further removed from classical usage than many other scientific terms derived from the Greek; it has besides a mythical and metaphorical propriety, as Heliads (Heliades) in ancient mythology were children of the Sun, and the time measure may also metaphorically be reckoned a child of the sun."

The second word, "Chrone" or "Chron," as a monosyllable, presents but one verbal element of the idea to be expressed, and it is wanting in euphony, but it has the advantage of being a chief compound part of nearly all words already in common use relating to time. The following may be instanced:

1. Anachronism—an error in point of time.
2. Chronide—a narrative in the order of time.
3. Chronic—continuing a long time.
4. Chronogram—a writing including the date of an event.
5. Chronograph—a stop-watch.
6. Chronometer—an instrument for measuring time.
7. Chronology—the science which treats of dates in the order of time.
8. Chronometry—the art of measuring time.
9. Isochronous—occurring in equal times.
10. Metachronism—an error in chronology.
11. Parachronism—dating an event later than the time it happened.
12. Prochronism—dating an event in advance of the time it happened.
13. Synchronal—happening at the same time.

The Hour Meridians.

The designation of the hour meridians is becoming a question of practical interest in connection with legislation required in nearly all countries respecting the reckoning of time. It is important for that and other reasons, that a nomenclature be adopted which will obviate all confusion and give the greatest satisfaction in future years in all quarters of the globe. In North America the 75th meridian west has tentatively received the name "Eastern," from the fact that it passes near the eastern coast of the United States. South of the equator, however, the term becomes inadmissible, inasmuch as the same hour meridian follows approximately the western coast of South America. Again, the 105th meridian west has been distinguished as the "Mountain" meridian, for the reason that it traverses the Rocky Mountains in the United States. This hour meridian, followed north, passes through the great prairie region of Canada, and followed south it meets no land whatever. After leaving the coast of Mexico it passes over the Pacific Ocean to the antarctic circle.

In Europe the name "Adria" has been attached to the meridian 15 east, owing to the fact that it

intersects the Adriatic Sea. This designation may be acceptable in Europe, while less appropriate or wholly inappropriate in the southern hemisphere.

Owing to the restricted meaning of nearly all local or geographical terms, it is obvious to the committee that it will be difficult, if not impracticable, to supply names based on such terms as will prove universally acceptable in both hemispheres, and the difficulty is increased by reason of the diversity of language among the several nations.

The committee, after much consideration, is of opinion that as a nomenclature based on numbers would have the one meaning in all languages, and would be equally appropriate in both hemispheres, the twenty-four hour meridians should be distinguished by numbers. Everything considered, it would, in the opinion of the committee, be most advantageous to commence the series of numbers at the ante-prime meridian as zero, and follow the apparent motion of the sun towards the west.

With the view of obtaining approval to the proposed nomenclature, or an expression of opinion regarding it, the committee recommends that the council be requested to bring the matter to the attention of scientific men and sister societies in other countries.

The report was adopted, and the meeting then adjourned.

SESSION IV. (*May 29th*).

The Society met in the William Molson Hall, on Friday afternoon, at 4.30 o'clock p.m. The President, Very Rev. Principal Grant, took the chair and called the meeting to order.

The following gentlemen were appointed the printing committee for the coming year: Sir Wm. Dawson, Dr. Fréchette, Prof. Alex. Johnson, Dr. Bourinot and the Abbé Verreau.

The Secretaries of the four sections, then in due order, presented their reports as follows:

Montréal, 29 mai 1891.

Rapport de la Section I.

Nous avons élu le bureau suivant:

Mgr Tanguay, Président.
M. L. O. David, Vice-Président.
M. A. D. De Celles, Secrétaire.

Séance du 29 *mai* 1891.

Sur proposition de Mgr Tanguay, appuyé par M. Faucher de Saint-Maurice, sont nommés membres du bureau d'impression: MM. Louis Fréchette, L. O. David et M. l'abbé Verreau.

Pour l'énumération des travaux déposés et reçus, voir le document imprimé ci-joint.

(Signé) A. D. De Celles,
Secrétaire,
par Joseph Marmette.

1. Un travail intitulé: "A Vancouver par le Pacific Canadien," par M. Louis Fréchette.
2. Notes sur le général Richard Montgomery, et sur l'expédition de 1775, par M. Faucher de Saint-Maurice.
3. Une comédie en prose, en un acte, intitulée: "Sous les Bois," par M. Pamphile Le May.

4. Les Progrès de la langue française écrite au Canada, par M. Alphonse Lusignan.
5. Coup d'œil sur notre Littérature nationale (canadienne-française), par M. N. Legendre.
6. Etude historique: Nos trois héroïnes — Mme de Champlain, Mme de la Tour, Mlle M. de Verchères, par M. J. M. Le Moine.
7. Une visite à Abbotsford au château de sir Walter Scott, en Ecosse, par M. J. M. Le Moine.
8. Le Laboureur canadien d'autrefois, par le révérend T. Lafleur, présenté par M. A. Lusignan.
9. Le Siège de Québec en 1759, d'après des pièces inédites, par M. l'abbé Casgrain.
10. Les origines de l'imprimerie au Canada, par M. Philéas Gagnon, présenté par M. l'abbé Casgrain.
11. Les Merveilles de la Création dans les petites choses, par M. l'abbé Provencher.
12. Le District des Trois-Rivières, par M. B. Sulte.
13. Le Tremblement de terre de 1663 dans la Nouvelle-France (Canada), par M. Alphonse Gagnon, présenté par M. l'abbé Casgrain.
14. L. J. Papineau, d'après quelques fragments de sa correspondance, par M. A. D. De Celles.
15. Jacques Cartier : Questions de Droit International, etc., par M. l'abbé Verreau.

Report of Section II.

The Secretary of Section II begs to report that the following papers were read at the meetings of the section :—

1. The site of fort Latour. By W. J. Ganong, M.A. Communicated by Dr. Geo. Stewart, F.R.G.S.
2. Ticonderoga and its Memories. By Dr. W. H. Withrow.
3. Cape Breton and its Memorials of the French Régime. By Dr. Bourinot, C.M.G.
4. Notes on a Hooped Cannon found at Louisbourg. By Rev. Dr. Patterson.
5. Governor Murray and the first years of British Rule in Canada. By John Reade, M.A.
6. Opportunities for the study of Folk-Lore in Canada. By the same.
7. The Bethucks or Red Indians of Newfoundland. By Rev. Dr. Patterson.
8. Notes and Observations on the Shuswop People of British Columbia. By Dr. George M. Dawson.
9. Grammar of the Haida Language, Queen Charlotte Islands, B.C. By the Rev. Charles Harrison. Communicated by Dr. George Dawson.
10. The Ethics of Crime and Punishment in Primitive Canada. By J. M. Le Moine.
11. Language as a Test of Mental Capacity. By Horatio Hale.
12. Lessing's Laokoön : A Vade Mecum for Critics. By William C. H. Wood, Quebec. Communicated by Dr. George Stewart, F.R.G.S.
13. A Proposal for a Dominion Text Book of Canadian History. By Professor J. Clark Murray.
14. Ville Marie. A Poem by the Very Reverend Æneas McD. Dawson.
15. Notes by the late Robert Morrow, of Halifax, (1) The Discovery and Colonization of Greenland in the Tenth Century. (2) Early Scandinavian Voyages to America. Communicated by Dr. Sandford Fleming, C.M.G.
17. Descriptive Notes on certain implements, weapons, etc., from Graham Island, Queen Charlotte Islands, B.C. By Mr. Alex. MacKenzie. Communicated by Dr. G. M. Dawson.

There were present at the meeting twelve out of nineteen members. Sir Daniel Wilson and Mr. Charles Mair sent excuses for their non-attendance.

The section unanimously elected Prof. W. Clark of Trinity College, Toronto, a fellow of this society, and begs leave to ask the ratification of that election by the Royal Society. Prof. Clark will occupy the vacancy caused by the lamented death of the late John Lesperance.

The following gentlemen were elected office-bearers for the year 1891-92:

Rev. George Patterson, D.D., *President.*
Wm. Kingsford, LL.D., *Vice-President.*
George Stewart, LL.D., D.C.L. F.R.G.S., *Secretary.*

The printing committee for the year, consisting of Dr. George Stewart, President, Dr. J. G. Bourinot and Dr. W. H. Withrow, was appointed.

Report of Section III.

Section III has to report that the members have held four meetings, viz.: May 27th, 2.30 p.m.; May 28th, 3 p.m.; May 29th, 11.30 a.m.; May 29th, 2.30 p.m.; that the papers presented to the section were seventeen in number, of which sixteen were read, one taken as read.

Important discussions ensued after the reading of these papers, a list of which is appended.

At the forenoon meeting May 29th the election of officers was held, with the following result:

Prof. J. G. McGregor, *President.*
Prof. E. J. Chapman, *Vice-President.*
Mr. F. N. Gisborne, *Secretary.*

1. De la Certitude dans les Sciences d'Observation. Presidential address by Mgr. T. Hamel.
2. Automatic and Multiplex Telegraphy, by F. N. Gisborne.
3. The Use of a Symbolic Form of de Moivres Function, by Prof. N. F. Dupuis.
4. An Attempt at deducing the Pressure under which a Steam Boiler Explodes from the Dynamic Effects produced by the Explosion, by C. Baillairgé.
5. A Paper relating to the Steam Boiler Explosion at Sillery, near Quebec, by the same.
6. Establissement des Formules de Wrouski relatives à la Mécanique Céleste, par le Dr. A. Duval de l'Ecole Royale Militaire de Kingston. Présenté par Mgr. T. E. Hamel. (Taken as read referred to Messrs. Deville and Carpmael).
7. (*a*) On the Variation with Temperature and Concentration of the Absorption Spectra of aqueous Solution of Salts, by Prof. J. G. McGregor.
   (*b*) On the Density of weak aqueous Solutions of Nickel Sulphate, by the same.
   (*c*) On the Relativity of Force and the Third Law of Motion, by the same. (Referred to Messrs. Deville and Carpmael.)
8. The Synthesis of a new Di-quinoline, by Dr. R. F. Ruttan. Communicated by Dr. Girdwood.
9. Faraday's "Lines of Force:" Suggestion of a Name, by Alexander Johnson, M.A., LL.D.
10. On Newton's use of the slit in the formation of the Spectrum, by the same.
11. A New Oxy-Ether Lamp, by G. R. Prowse, Montreal. Communicated by Dr. Johnson.
12. Memoranda as to preparations for the proposed Telegraphic Longitude Determination: Greenwich—Montreal, by Prof. McLeod, Ma.E. Communicated by Dr. Johnson.
13. Observations of Sun Spots, May, 1890, to May, 1891, by Prof. McLeod, Ma.E. Communicated by Dr. Johnson.
14. (*a*) On the Time Unit; (*b*) On the Hour Meridians, by Dr. Sandford Fleming, C.M.G.
15. On Moral, Metaphysical and Personal Elements in Statistics, by George Hague, Esq. Communicated by Sir William Dawson.

Report of Section IV.

At the present meeting fifteen members of the section were present.

The number of papers read, either *in extenso* or by title, was sixteen.

The officers of the section were elected as follows:

President, G. F. MATTHEW.
Vice-President, J. F. WHITEAVES.
Secretary, JAMES FLETCHER.

Prof. Fowler, of Queen's University, Kingston, was unanimously nominated a fellow of the society.

The section adopted a resolution approving of the formation of an association to be entitled the Botanical Club of Canada, to be affiliated, like kindred associations, with the Royal Society of Canada. A committee was appointed to report on the subject, and they suggested the names of a number of gentlemen to act as an executive to carry out this project. The committee recommend this idea to the favourable consideration of the society.

The committee also made a recommendation in regard to the discussion of the subject of science in schools before the society and the best way of bringing it before the public, which is subjoined herewith.

J. F. WHITEAVES,
Secretary.

A discussion having incidentally arisen in Section IV on teaching of science in schools, the subject was referred to the committee to consider how the subject may be best brought before the Royal Society and the public for consideration. The committee report as follows:

Present: Messrs. Laflamme, Matthew, Penhallow, Macoun, Burgess, McKay, Lawson, Fletcher, and Hay (by invitation of chairman).

The committee recommend that the Royal Society approve of the formation of a body entirely independent of the society, but associated with and having the same relation as other literary and scientific societies of the Dominion.

That such body be called the Botanical Club of Canada.

The committee recommend that the following executive officers be requested to act for the present year:

President, Prof. LAWSON.
Secretary and Treasurer, A. H. MCKAY.

Secretaries for Provinces.

Quebec, Prof. PENHALLOW.
Ontario, Prof. MACOUN.
New Brunswick, GEORGE U. HAY.
Nova Scotia, E. J. LAY, Amherst.
Prince Edward Island, — BAIN, Charlottetown.
Manitoba, — BURMAN.
Newfoundland, Rev. Mr. WAGHORNE.
British Columbia, Dr. NEWCOME, Victoria, B.C.
Northwest Territories, W. H. GALBRAITH, Lethbridge, Alta (Alberta Territory.)

That an assessment of 25 cents be made for the present year to cover expenses.

In reference to Prof. Mills's suggestion relative to the teaching of science in schools, the committee recommend that Prof. Mills be requested to prepare the popular lecture for next meeting of the Royal Society, when this subject could be brought fully before the public. Further, that a synopsis of his views may be mailed to each fellow of the society, as a preparation for discussion.

The following amendment was made, on the recommendation of the council, in rule 6, providing for the election of fellows of the society:

That the third paragraph be amended to read as follows: "Each section shall have power to increase its number by electing one new member annually."

Rule 6 as amended accordingly reads as follows: (*vid.* p. LXXII *infra.*)

The following communication was received from Section II:

MONTREAL, May 29th, 1891.

Section II begs leave to report the unanimous election of the Rev. Moses Harvey, F.R.G.S., LL.D., of St. John's, Newfoundland, and author of "The History of Newfoundland," "Lectures, Literary and Biographical," etc., to fill the special vacancy under regulation 6, and asks the Royal Society to ratify the election.

On motion of Dr. Sandford Fleming, seconded by Col. Denison, Prof. Clark was elected a fellow of the Royal Society.

On motion of Dr. Fleming, seconded by Dr. Stewart, Prof. Harvey was elected a fellow of the Royal Society.

Mr. Whiteaves read the following report of the committee appointed to devise some systematic scheme for the recording of seasonal events in natural history and meteorology:

The committee appointed to devise some systematic scheme for the recording of seasonal events in natural history and meteorology reported as follows:

That during the past winter the members resident in Ottawa held several meetings, at which Profs. Carpmael and Macoun were added to their number.

That they prepared a preliminary draft schedule for observations, and then sent a type-written copy thereof to each of its members, with a request for suggestions or amendments.

That, in reply to this request, several suggestions were received, which were subsequently incorporated into an amended schedule, a copy of which was sent to each member for immediate use.

Your committee ask to be continued, with authority to print and distribute circulars and forms for observation.

The whole respectfully submitted.

J. F. WHITEAVES,
Chairman.

The committee was continued and authorized to print and distribute such circulars as might be deemed desirable.

On motion of Mgr. Hamel, seconded by Dr. Kingsford a vote of thanks was passed to Principal Grant for the able manner in which he performed his duties as president during the past year.

The society then adjourned.

REGULATIONS

OF THE

ROYAL SOCIETY OF CANADA.

(*AS REVISED TO MAY*, 1891.)

1.—*Objects of the Society.*

The objects of the Society are set forth in the preamble of the Act of Incorporation as follows: first, to encourage studies and investigations in literature and science; secondly, to publish transactions annually or semi-annually, containing the minutes of proceedings at meetings, records of the work performed, original papers and memoirs of merit and such other documents as may be deemed worthy of publication; thirdly, to offer prizes or other inducements for valuable papers on subjects relating to Canada, and to aid researches already begun and carried so far as to render their ultimate value probable; fourthly, to assist in the collection of specimens with a view to the formation of a Canadian museum of archives, ethnology, archæology and natural history.

2.—*Name.*

By the gracious permission of Her Majesty the Queen, the Society will bear the name of the Royal Society of Canada, and the members shall be entitled "Fellows of the Royal Society of Canada."

3.—*Honorary President and Patron.*

His Excellency the Governor-General shall be the Honorary President and Patron of the Society.

4.—*Division into Sections.*

The Society shall consist of the four following sections:

1. French Literature, with History, Archæology and allied subjects.
2. English Literature, with History, Archæology and allied subjects.
3. Mathematical, Chemical and Physical Sciences.
4. Geological and Biological Sciences.

The sections may meet separately for the reading and discussion of papers, and for business, at such times and places as may be fixed by the sections under the control of the Council.

5.—*Officers.*

The officers of the Society shall be a President and Vice-President, with an Honorary Secretary and a Treasurer, to be elected by the whole Society; besides a President, Vice-President and Secretary of each section, to be elected by the section. The elections shall be annual.

The Council of the Society shall consist of the officers so elected, and of ex-presidents, during three years from the date of their retirement from the office of president, and of such ex-members of the Council, not exceeding four in number, as may be selected by the Council itself. The ex-members, so elected, shall continue in office for three years, and afterwards until successors are appointed.

6.—*Members.*

The Fellows shall be persons resident in the Dominion of Canada, or in Newfoundland, who have published original works or memoirs of merit, or have rendered eminent services to Literature or to Science.

The number of members in each section shall be in general limited to twenty, but may be increased if any section should so desire, in the manner hereinafter indicated. Nominations to fill vacancies in any section may be made at any time in writing by any three members of that section, and the nomination papers shall be lodged with the Honorary Secretary, who shall make a record of them. When the vacancy occurs, the Honorary Secretary shall notify the members of the section in which it has taken place, and transmit to each a printed list of the candidates nominated, at least four months before the annual or any general meeting of the Society. Each member may then place a mark (×) opposite the name of the candidate for whom he votes, and return the voting paper to the Honorary Secretary, who shall report to the Council at a meeting, to be held at least two months before the annual meeting, the number of votes obtained by each candidate. Should any of these have obtained a majority of the whole section, the Council shall so report to the Society. Should this result not be attained, then the Council may select one or more of the candidates obtaining the highest number of votes of the section, and cause the members of the Society to be advised of the names of the candidates so selected, at least one month previous to the date of the annual meeting, when the election may take place by vote of the members present, or the matter be referred back to the section concerned, to select names from among the candidates nominated, and recommend them to the Society for election. This selection and recommendation by the section shall be made on the first day of the meeting at 2.30 p.m., unless otherwise ordered at that time by the section. If there be two or more vacancies the selection shall be made by a separate vote for each vacancy.

Each section shall have power to increase its number by electing one new member annually. The proposal to elect an additional member shall be made by nominations in the usual manner, but each member of the section shall have the opportunity of voting against the election of an additional member absolutely; and if the majority of votes be against the election of an additional member, then no such member shall be elected for that year. This clause shall cease to operate as soon as the total number in any section shall have reached twenty-five.

7.—*Duties of Members.*

Members shall sign the regulations of the Society, shall be presented by the President to the Society at a general meeting of the same, shall attend its stated meetings or send reasons of absence to the Honorary Secretary, and shall pay an annual subscription of $2.00 or the sum of $20.00 in one payment in commutation of the same for life membership. These payments shall entitle members to receive the Transactions of the Society.

Any member may withdraw from the Society, and the Society may, by resolution in general

session on the recommendation of the Council, grant to such member the privilege of retaining his title, and his name shall thenceforward be entered on the lists as a retired member retaining title.

Any member failing to attend three years in succession, without presenting a paper, or assigning reasons in writing satisfactory to the Society, shall be considered to have resigned.

8.—*Corresponding Members.*

The Society may elect by ballot on proposal by three members, or on recommendation of the Council, persons not resident in Canada as corresponding members. Such persons must be eminent in literature or science, and evidence to that effect must be presented to the Society at the time of their proposal or recommendation. The number of corresponding members shall be limited to sixteen.

That in acting under rule 8 of the constitution, four of the corresponding members shall be elected for each section; and the name or names proposed, the names of the proposers, and the reasons in writing, shall be announced to the Society through the Honorary Secretary, at least one day before the balloting for any such corresponding member. (Resolution of May, 1884.)

9.—*Meetings.*

The Society shall hold an annual meeting in such city of the Dominion as it may determine from time to time. It may at any annual meeting appoint other meetings to be held in the course of the year. The time of holding the annual meeting shall be on a day or days to be determined at the next previous meeting, or, failing this, by the Council. The offices of the Society shall be in the city of Ottawa, and its meeting shall be held in that city unless otherwise determined.

10.—*Papers.*

The title of any Paper, Memoir or other production, by a member, intended to be read at a meeting of the Society, shall be submitted, together with an abstract of its contents, to the Council, through the Secretary, previous to the meeting at which it is to be read. On its approval, each such communication shall be assigned to the section to which it belongs, and having been therein read and discussed, shall be submitted to a committee of the section, and on report of said committee, may be recommended to the Council for publication, either entire or in abstract, in the Transactions of the Society. Communications by persons not members of the Society may be submitted by members on the same conditions as their own productions.

11.—*Associated Societies.*

Every scientific or literary society in the Dominion which may be selected by vote of the Society shall be invited by circular of the Honorary Secretary to elect annually one of its members as a delegate to the meetings of the Society, such delegate to have, during his term of office, the privilege of taking part in all general or sectional meetings for reading and discussion of papers, and to be empowered to communicate a short statement of original work done and papers published during the year by his society, and to report on any matters in which the Royal Society may usefully aid in publication or otherwise.

12.—*Circulation of Transactions.*

Copies of the Transactions of the Society shall be sent to the following:—

All members who have paid their subscriptions.
All Associated Societies.

Such foreign Societies as may be selected by the Council.
The Lieutenant-Governors of the Provinces of the Dominion and Newfoundland.
The members of the Privy Council of Canada.
The Chief Justice and Judges of the Supreme Court of Canada.
The Speakers of the Senate and House of Commons.
The Chief Justice of each Province.
The Premier of each Province.
The Speakers of the Legislatures of each Province.
The Minister or Superintendent of Education in each Province.
The Universities, the Library of Parliament and the Libraries of Provincial Legislatures.

13.—*Duties of Council.*

The Council shall manage all the affairs of the Society in the intervals of its meetings, and shall make arrangements for the meetings. It shall meet at the call of the President. Three members shall be a quorum.

The Council shall report its proceedings at each meeting of the Society for sanction.

The Council shall have the custody and disposal of all moneys, collections and other property of the Society, subject to sanction of its proceedings as above.

In the absence of the President and Vice-President, the Council may appoint a temporary chairman, and in the case of vacancy of the office of Honorary Secretary or Treasurer may appoint a temporary Secretary or Treasurer to hold office till the next meeting of the Society.

14.—*Duties of the Honorary Secretary.*

The Honorary Secretary shall keep the minutes of the Society and Council, and shall conduct their correspondence, shall receive and attend to all nominations for members and officers of sections, shall keep the lists and records of the Society, and, under advice of the President, shall attend to any business that may arise in the intervals of meetings. He may, with consent of the Council, delegate any part of his duties to a paid assistant appointed by the Council.

15.—*Duties of the Treasurer.*

The Treasurer shall have the custody of all moneys of the Society, shall keep account of the same and submit these to the Council at its meetings, and shall receive subscriptions, grants and donations, and make disbursements as shall be ordered by the Council.

16.—*Addresses and Special Reports.*

It shall be the duty of the President, or in event of his being unable to do so, of the Vice-President, to prepare an address for each annual meeting.

It shall be the duty of the President of each section, or in event of his being unable to do so, of the Vice-President, to prepare an address, having reference to the special objects of the section, for each annual meeting.

The Society in general session, or any of the sections, with consent of the Society, may appoint committees to prepare reports on any special literary or scientific matters, or on the progress of literature and science, or on works published in Canada, and to suggest such honorary notice as may seem desirable in the case of meritorious works or researches.

The ordinary committee of the section shall be limited to three in number, and consist of the officers of the section or any members that the section may select to make up the number.

17.—*Reading of Papers.*

I.—The representatives of each section in the Council shall be the judges of the papers to be accepted or rejected. No paper shall be read in any section, at any general meeting of the Society, unless it has been presented, either in full or in abstract, at least three weeks before the first day of the meeting, and formally accepted by the Council, in accordance with rule X of the Society, except by special permission of the Council. The publication of any paper not so accepted, as having been read before or presented to it, may be disavowed by the Society.

II.—No paper already published shall be accepted by the Society except in cases where it shall have been entirely recast.

III.—A programme containing the titles of papers to be read shall be printed and sent to the members of the Society at least one week before the time of meeting.

IV.—It shall be the duty of the Secretaries of each section to prepare before each day's meeting a list of the papers to be presented to each section, with the names of the authors and the time demanded for their reading. These lists shall be printed and made public each morning before the time fixed for the meeting.

18.—*Publication of Papers.*

I.—The author shall revise his MS. after reading, to prepare it for the press.

II.—The first proof in galley shall be sent to the author, and also a revise in galley.

III.—The matter shall then be put into page, and a proof sent to the Secretary of the section to which it belongs, who will sign the proof when he has corrected it. Should the author demand it, he may see a proof in page.

IV.—The Chairman of the Printing Committee or his deputy will sign the final revise, and will see that conformity in headings and in type is observed.

V.—If the authors of papers are to be absent in places not accessible without delay, they shall indicate some person by whom the proofs shall be read, failing which the Secretary of the section shall be responsible for their reading and correction.

VI.—If, from the absence of the author, the proof of a paper cannot be read by him, and he has named no representative, and if the Secretary will not read it, the Printing Committee shall not delay the volume for the author's return, but shall omit the paper.

VII.—All matter in the French language shall be read for literal errors by a French proof-reader skilled in the typographic art, and familiar with the present usage in France.

THE ROYAL SOCIETY OF CANADA.

FOUNDER: THE RIGHT HONOURABLE THE MARQUIS OF LORNE.

OFFICERS FOR 1891-92.

HONORARY PRESIDENT AND PATRON:

HIS EXCELLENCY THE RIGHT HONOURABLE THE LORD STANLEY OF PRESTON, G.C.B.

PRESIDENT - - - - ABBÉ J. C. K. LAFLAMME, D.D.

VICE-PRESIDENT - - - JOHN GEO. BOURINOT, C.M.G., LL.D. D.C.L.

EX-PRESIDENTS.

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ABBÉ H. R. CASGRAIN, LL. D.
SANDFORD FLEMING, C.M.G., LL.D.
G. LAWSON, Ph.D., LL.D.

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SECRETARY - - - - JAMES FLETCHER.

HONORARY SECRETARY - - - - - G. C. HOFFMANN, F. Inst Chem.
HONORARY TREASURER - - - - - A. R. C. SELWYN, C.M.G., LL.D.

The Council for 1891-92 comprises the President and Vice-President of the Society, the Presidents, Vice-Presidents and Secretaries of Sections, the Honorary Secretary, and the Honorary Treasurer, besides ex-Presidents of the Society (Rule 7) during three years from the date of their retirement, and any four members of the Society who have formerly served on the Council, if the Council should elect them every year.

THE ROYAL SOCIETY OF CANADA.

LIST OF MEMBERS, 1891-92.

I.—LITTÉRATURE FRANÇAISE, HISTOIRE, ARCHÉOLOGIE, ETC.

BÉGIN, S. G. MGR L. N., Évêque de *Chicoutimi.*

CASGRAIN, L'ABBÉ H.-R., LL.D., *Québec.*, (ex-President).

CUOQ, L'ABBÉ, *Montréal.*

DAVID, L. O., *Montréal.*

DE CAZES, PAUL, *Québec.*

DE CELLES, A. D., *Ottawa.*

FABRE, HECTOR, *Paris, France.*

FAUCHER DE SAINT-MAURICE, N., D.L., *Québec.*

FRÉCHETTE, LOUIS, LL.D., D. L., *Montréal.*

LEGENDRE, NAPOLÉON, *Québec.*

LEMAY, PAMPHILE, D.L., *Québec.*

LEMOINE, J. M., *Québec.*

LUSIGNAN, A., *Ottawa.*

MARCHAND, L'HON. F.-G., *Saint-Jean, P.Q.*

MARMETTE, JOSEPH, D.L., *Ottawa.*

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ROY, JOSEPH EDMOND, *Lévis, P.Q.*

SULTE, BENJAMIN, *Ottawa.*

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TASSÉ, JOSEPH, l'hon., *Montréal.*

VERREAU, L'ABBÉ HOSPICE, LL.D., *Montréal.*

II.—ENGLISH LITERATURE, HISTORY, ARCHÆOLOGY, ETC.

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DENISON, LT.-COL. G. T., B.C.L., *Toronto.*

GRANT, VERY REV. G. M., D.D., Principal of Queen's University, *Kingston*, (ex-President.)

HALE, HORATIO, *Clinton.*

HARVEY, REV. MOSES, F.R.G.S., LL.D., *St. John's, Newfoundland.*

KINGSFORD, WILLIAM, LL.D., *Ottawa.*

KIRBY, WILLIAM, *Niagara.*

MAIR, CHARLES, *Prince Albert, N. W. T.*

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MURRAY, REV. J. CLARK, LL.D., McGill University, *Montreal.*

MCCOLL, EVAN, Toronto.

PATTERSON, REV. GEORGE, D.D., *New Glasgow, N.S.*

READE, JOHN, *Montreal.*

ROBERTS, CHARLES G.D., M.A., King's College, *Windsor, N.S.*

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WATSON, J., M.A., LL.D., Queen's University, *Kingston.*

WILSON, SIR DANIEL, LL.D., F.R.S.E., President of University of Toronto, *Toronto* (ex-President).

WITHROW, REV. W. H., D.D., *Toronto.*

III.—MATHEMATICAL, PHYSICAL AND CHEMICAL SCIENCES.

Baillairgé, C., C.E., *Quebec.*

Bovey, H. T., M.A., C.E., McGill University, *Montreal.*

Carpmael, C., M.A., Superintendent of Meteorological Service, *Toronto.*

Chapman, E. J., Ph.D., LL.D., University of Toronto, *Toronto.*

Deville, E., Surveyor General, *Ottawa.*

Dupuis, N. F., M.A., F.R.S.E., Queen's University, *Kingston.*

Ellis, W. H., M.D., Toronto University, *Toronto.*

Fleming, Sandford, C.M.G., LL.D., C.E., *Ottawa* (ex-President).

Girdwood, G. P., M.D., McGill University, *Montreal.*

Gisborne, F. N., M.I.T.E.E., C.E., *Ottawa.*

Goodwin, W. L., D.Sc., Queen's University, *Kingston.*

Hamel, Monsignor, M.A., Laval University, *Quebec* (ex-President).

Harrington, B. J., B.A., Ph.D., McGill University, *Montreal.*

Hoffmann, G. C., F. Inst. Chem., Geological Survey, *Ottawa.*

Hunt, T. Sterry, M.A., LL.D., F.R.S., Park Avenue Hotel, *New York,* (ex-President).

Johnson, A., LL.D., McGill University, *Montreal.*

Keefer, T. C., C.M.G., *Ottawa.*

Loudon, J. T., M.A., University of Toronto, *Toronto.*

Macfarlane, T., M.E., *Ottawa.*

MacGregor, J. G., M.A., D.Sc., F.R.S.E., Dalhousie University, *Halifax.*

IV.—GEOLOGICAL AND BIOLOGICAL SCIENCES.

Bailey, L. W., M.A., Ph.D., University of New Brunswick, *Fredericton.*

Bell, Robert, B.Ap.Sc., M.D., LL.D., F.G.S., Geological Survey, *Ottawa.*

Burgess, T. J. W., M.D., *Montreal.*

Dawson, G. M., D.Sc., A.R.S.M., F.G.S., Geological Survey, *Ottawa.*

Dawson, Sir J. William, C.M.G., LL.D., F.R.S., Principal of McGill University, *Montreal* (ex-President).

Fletcher, James, the Entomologist, *Ottawa.*

Fowler, James, M.A., Queen's University, *Kingston.*

Gilpin, Edwin, M.A., F.G.S., Inspector of Mines, *Halifax.*

Grant, Sir J. A., K.C.M.G., M.D., F.G.S., *Ottawa.*

Laflamme, Abbé J. C. K., D.D., M.A., Laval University, *Quebec.*

Lawson, G., Ph.D., LL.D., Dalhousie University, *Halifax* (ex-President).

Macoun, J., M.A., F.L.S., Geological Survey, *Ottawa.*

Matthew, G. F., M.A., *St. John, N.B.*

MacKay, A. H., B.A., B.Sc., *Halifax.*

Mills, T. Wesley, M.A., M.D., McGill University, *Montreal.*

Penhallow, D. P., B.Sc., McGill University, *Montreal.*

Provancher, Abbé, *Cap Rouge, Quebec.*

Saunders, W., Director of the Experimental Farms, *Ottawa.*

Selwyn, A. R. C., C.M.G. LL.D., F.R.S., F.G.S., Director of the Geological Survey, *Ottawa.*

Whiteaves, J. F., F.G.S., Geological Survey, *Ottawa.*

Wright, R. Ramsay, M.A., B.Sc., University of Toronto, *Toronto.*

CORRESPONDING MEMBERS.

The Marquis of Lorne.

Bonney, T. G., D.Sc., LL.D., F.R.S., *London, England.*

Doucet, Camille, secrétaire perpétuel de l'Académie française, *Paris, France.*

Le Roy, Alphonse, professeur de philosophie à l'université de Liège, et membre de l'Académie royale de Belgique, *Liège, Belgium.*

Marmier, Xavier, de l'Académie française, *Paris, France.*

Parkman, Francis, LL.D., *Boston, Mass.*

Rameau de Saint Père, Edmè, D.L., *Adon, Loiret, France.*

Winsor, Justin, LL.D., *Boston, Mass.*

RETIRED MEMBERS. (See Rule 7.)

Bourassa, Napoléon, *Montebello.*

Gilpin, J. Bernard, M.D., M.R.C.S., *Halifax.*

Osler, W., M.D., Johns Hopkins University, *Baltimore, Md.*

Cherriman, J. B., M.A., *Ryde, Isle of Wight.*

Haanel, E., Ph.D., Syracuse University, *Syracuse, N.Y.*

LIST OF PRESIDENTS.

1882–'83	Sir J. W. Dawson.
1883–'84	Hon. P. J. O. Chauveau.
1884–'85	Dr. T. Sterry Hunt.
1885–'86	Sir Daniel Wilson.
1886–'87	Monsignor Hamel.
1887–'88	Dr. G. Lawson.
1888–'89	Sandford Fleming.
1889–'90	Abbé Casgrain.
1890–91	Principal Grant.
1891–92	Abbé Laflamme.

SOCIÉTÉ ROYALE DU CANADA

MÉMOIRES

SECTION I

LITTÉRATURE FRANÇAISE, HISTOIRE, ARCHÉOLOGIE, ETC.

ANNÉE 1891

I. — *Quelques notes sur le général Richard Montgomery.*

Narcisse Henri Faucher

Par M. FAUCHER DE SAINT-MAURICE, *chevalier de la Légion d'Honneur, docteur-ès-lettres.*

(Lu le 29 mai 1891.)

Il y a déjà quelque temps, je recevais du R. P. Moylan, de la Société de Jésus, une brochure fort intéressante et tirée à un petit nombre d'exemplaires. Cette étude est due, je crois, à Mlle Louise Livingston Hunt, une des parentes du général Montgomery. Elle contient des notes curieuses sur le malheureux officier américain qui est venu mourir sous les murs de Québec pendant la terrible nuit du 31 décembre 1775. Elle nous fait voir le côté intime de la vie de Montgomery. Elle nous montre tout le cas que le général faisait de la justice de la cause de son pays. Elle nous peint tout son courage, toute l'importance qu'il attachait à l'accomplissement de son devoir.

Le général Montgomery était né en Irlande. Officier dans l'armée anglaise, il passa sa jeunesse à faire la guerre contre les Français et les tribus indiennes. En Angleterre, il fut admis dans l'intimité de Fox, de Burke, de Barry. Leurs idées sur les droits des colonies empoignèrent cet esprit chaud, ardent, dévoué aux idées républicaines, et profitant un jour d'une injustice qu'on lui avait faite, en accordant à son préjudice une commission de major à un officier moins ancien que lui, il donna sa démission et vint s'établir près de New-York.

N'étant encore que capitaine dans l'armée anglaise, Montgomery avait fait la rencontre de Mlle Janet Livingston, fille de Robert R. Livingston, un des juges du Banc du Roi. Il avait ordre de rallier un poste lointain, et ce n'était que par pur hasard que ce soir là, il était descendu avec les officiers de la compagnie à la villa du juge, sise à Claremont, sur les bords de l'Hudson. On dansait : une invitation avait été envoyée aux militaires de passage.

Depuis, le souvenir de Mlle Janet l'avait suivi par terre et par mer. A son retour, sa première visite fut pour elle, et en juillet 1773, Mlle Livingston devenait Mme Montgomery.

J'ai sous les yeux la correspondance échangée à ce propos entre Montgomery et le juge Livingston ; j'en donne la traduction :

KINGSBRIDGE, mai 20, 1773.

MONSIEUR, —

Depuis longtemps je désire obtenir votre consentement ainsi que celui de Mme Livingston pour une affaire dont dépend entièrement mon bonheur futur, et, je l'espère aussi, celui de Mlle votre fille. J'ai toujours différé, n'osant pas vous entretenir de ce délicat sujet. Je me disais que notre connaissance n'était pas encore assez longue, et cette raison me faisait croire que vous désiriez encore mieux me connaître, avant d'en arriver à une décision. Je pensais alors me confier à un ami : je voulais lui demander de vous dire un mot en ma faveur. Aujourd'hui j'apprends que vous connaissez tout

mon amour pour Mlle Livingston. Aussi craindrais-je qu'un silence plus long ne fût mal interprété. J'ose donc, Monsieur, vous demander ainsi qu'à Mme Livingston, votre consentement à notre mariage. Les qualités de cœur, l'amabilité, les vertus de Mlle Janet sont pour moi un sûr garant du bonheur futur de notre vie. Il sera doublé par l'idée d'être appelé "mon fils" par des parents aussi honorables que vous l'êtes. Si tout le calme, la tranquilité, le bonheur que je me propose de donner à ma femme peuvent entrer pour quelque chose dans la félicité des parents, soyez sûr que sous ce rapport je ne perdrai jamais votre estime.

Je demeure, Monsieur, avec un profond respect, votre très obéissant serviteur,

RICHARD MONTGOMERY.

Le juge Livingston répondit un mois après :

CLAREMONT, 21 juin 1773.

MONSIEUR, —

M. Lawrence, de Poughkeepsie, d'où je suis revenu la nuit dernière, m'a remis votre lettre si courtoise.

Les affaires de cour m'ont tellement absorbé nuit et jour que je n'ai pas encore su trouver le temps de vous répondre. Il est vrai qu'à la rigueur j'aurais pu prendre une heure pour m'acquitter de cet agréable devoir, mais je n'étais pas seul, et je crois qu'il était de bon goût de consulter aussi Mme Livingston.

Depuis que nous avons appris votre projet, nous n'avons considéré que le bonheur de notre enfant. Nous avons fait toutes les démarches requises en matière aussi délicate, pour nous renseigner à notre satisfaction.

Nous vous accordons la main de notre fille. Nous faisons des vœux pour que vous jouissiez de tout le bonheur dont vous parlez dans votre lettre, et veuillez croire que nous en prendrons aussi notre large part.

Quand ce sera à votre convenance, j'espère que vous nous ferez le plaisir d'une visite à Claremont; et, en l'attendant, je demeure respectueusement votre humble serviteur,

ROBERT R. LIVINGSTON.

Mme Montgomery nous a laissé ce mémoire bien court sur les débuts de son mari comme officier américain :

"Le général Montgomery, descendait de ce comte de Montgomery qui, dans un tournoi, crèva un œil à Henri II, de France. Le roi mourut de sa blessure, et le malheureux comte expia sa maladresse sur l'échafaud. Les Montgomery émigrèrent alors dans les Pays-Bas. Un de leurs descendants suivit Guillaume d'Orange en Angleterre, commanda un régiment pendant les guerres d'Irlande, et sut s'enrichir par son courage. La fin de la guerre le trouva propriétaire de trois fiefs.

"Le général Montgomery est né à Dublin, et fit ses études au collège de cette ville. Son père, Thomas Montgomery, eut trois fils : Alexandre, Jean, Richard, et une fille, qui plus tard épousa le vicomte Ranelagh. Le plus vieux des fils, Alexandre, servit sous Wolfe, lors de la guerre qui précéda la cession du Canada. Ce fut lui qui fut chargé de l'horrible mission de brûler, de piller et de dévaster les campagnes auprès de Québec, qui ne voulait pas se soumettre. Il incendia plus de 1,400 maisons, disent les documents du temps, et ne laissa derrière lui qu'une longue traînée de sang et d'horreur. Ce même Montgomery représenta plus tard, durant quarante ans, le comté de Donegall aux Com-

munes d'Angleterre. Jean entra dans le commerce, s'enrichit et mourut à Lisbonne. Richard était le cadet. Sa mère avait de la fortune : elle la laissa aux deux plus jeunes, l'aîné ayant hérité d'un oncle fort riche. Entré dans l'armée anglaise avec le grade d'enseigne dans le 17e de ligne, Richard prit part à la campagne du Cap-Breton, sous le général Amherst. Ce dernier se mit en marche pour rallier Wolfe ; plus tard, Montgomery avait l'habitude de dire que la marche forcée qui lui avait été commandée du côté d'Albany, sous les ordres d'Amherst, était ce qu'il avait fait de plus fatiguant dans sa carrière militaire. En apprenant la victoire de Wolfe, Amherst retourna à New-York.

" Quand on voulut mettre en vigueur la loi du Timbre, le 17e était retourné en Angleterre. Il reçut l'ordre de s'embarquer pour l'Amérique, et d'imposer cette loi par la force. En apprenant cette nouvelle, Montgomery et plusieurs de ses camarades déclarèrent publiquement qu'ils préféraient déchirer leur brevet d'officier et quitter l'armée, plutôt que d'aller molester ainsi ceux qu'ils avaient appris à estimer pendant leur long séjour dans leur pays.

" Dès 1771, Montgomery avait la promesse d'être promu major. L'argent nécessaire pour l'achat du brevet était déposé entre les mains de l'autorité, lorsque, à sa grande surprise un de ses camarades fut préféré. Cette injustice le dégoûta du métier. Il vendit sa commission de capitaine, et, en 1773, il s'embarqua pour New-York, où il acheta la ferme de Kingsbridge. Plus tard il alla demeurer à Rhine Creek, où il se construisit une belle maison ainsi qu'un moulin.

" Menant tranquillement la vie des champs, il se croyait complètement inconnu de ses voisins, quand en 1775 le comté " *Duchesse* " le délégua au Conseil des Cinquante, à New-York. Bien que pris au dépourvu par cet honneur inattendu, Montgomery n'hésita pas. Les temps étaient difficiles ; il devait accomplir son devoir de citoyen, et il le fit en homme. Sur ces entrefaites, le Congrès ordonna de lever des troupes pour défendre ses droits. Philippe Schuyler fut nommé major-général, et on offrit le grade de brigadier-général à Montgomery.

" Avant de l'accepter, il entra dans la chambre de sa femme et la pria de lui confectionner la cocarde réglementaire qui devait être mise à son chapeau. Elle ne put retenir ses larmes. Alors Montgomery lui prenant tendrement la main, lui dit :

"— Janet, la patrie est en danger. Sans que je l'aie demandé, on m'a successivement nommé député, puis général. Je ne suis pas assez politique pour être utile comme tel ; mais comme soldat je puis l'être. J'ai accepté le premier titre, je ne saurais refuser l'autre. Mon honneur m'y oblige.

" Mme Montgomery plaça la cocarde sur le chapeau du général.

" — Merci, fit celui-ci ; aie confiance en moi. Tu n'auras jamais à rougir d'un Montgomery.

" Puis il alla faire ses adieux au juge Livingston.

" — Ménagez votre vie, lui dit celui-ci affectueusement.

" — Père, vous voulez dire mon honneur, reprit Montgomery.

" En passant devant sa maison, Montgomery détourna la tête en disant à l'un de ses compagnons :

" — Je ne dois pas regarder de ce côté-là.

" Et il partit pour New-York, où devait bientôt passer Washington, en route pour Boston. Il trouva la ville sur pied : on l'attendait. La milice était sous les armes, les cloches

carillonnaient, les tambours battaient la générale. Rendu dans Broadway, il vit passer Washington. Montgomery était dans une maison sise en face de l'hôtel de ville. Le futur président des Etats-Unis remit leurs brevets d'officier général à Schuyler et à Richard, ainsi que leurs instructions. Montgomery demanda à Washington de l'attacher à sa personne. Celui-ci lui répondit :

" — Général, vous avez une rude besogne à faire vous-même. Je me fie à vous sur tout et pour tout.

" Washington ne fit pas long séjour à New-York ; il partit de suite. Il voyageait en *sulky* traîné par une paire de chevaux blancs. Son uniforme était bleu ; il avait une ceinture pourpre et un chapeau à plume. Tout ceci sembla déplaire au gouverneur anglais Tryon.

" Partout on s'était mis à conspirer. Montgomery était tenu au courant de ce qui se passait, et, pour éviter l'effusion du sang, il donna au gouverneur Tryon le conseil de retourner en Angleterre, ce que fit ce dernier, la nuit même où lui parvint cet avis officieux.

" En ouvrant sa commission, Montgomery trouva en blanc tous les brevets des officiers de sa brigade. Telle était la confiance qu'il inspirait, qu'on lui en laissait entièrement le choix.

" A quelques jours de là, arriva le compte rendu de la bataille de Bunker Hill. Les journaux anglais en publiaient le récit. Ils étaient en grand deuil. Enfin le sang avait coulé : les Américains avaient été battus dans leur premier combat. Les quartiers du général étaient remplis de gens à longues figures. Ils demandaient des nouvelles ou des encouragements.

" — Messieurs, leur dit-il, je suis satisfait ! ce que je craignais n'est pas arrivé. Les Américains se sont battus. Ils ont tenu tête, et c'est là une expérience dont l'Anglais se souviendra.

" Les loyalistes se mirent à jubiler en apprenant le succès des troupes anglaises. Plusieurs dames vinrent réclamer la protection du quartier général. Les *messieurs* de leur côté ne se pressèrent pas de demander des brevets d'officier à Montgomery. Seuls, les ouvriers vinrent spontanément s'offrir. Le général les accepta, et quand les cadres de la brigade furent remplis, il eut la satisfaction de refuser plusieurs de ces "cockneys" qui s'offrirent, mais trop tard.

" — Vous auriez dû être les premiers, leur dit-il brusquement ; soyez maintenant soldats de deuxième classe.

" Montgomery partit pour Ticonderaga avec 4,000 hommes. En route il eut plusieurs malades et déserteurs. Peu habitués à la guerre, plusieurs se sauvaient même au bruit que faisait la chute d'une feuille.

" Montgomery, dégoûté, offrit trois fois sa démission. Le Congrès refusa chaque fois, lui promettant de lui envoyer 10,000 hommes de troupes. Ils n'arrivaient jamais. Sa patience était à bout. Le commandant en chef Schuyler était malade, ce qui faisait traîner la campagne. A peine arrivé sur les bords du lac Champlain, Montgomery embarqua ses troupes. Au fort Chambly, le canon fut tiré pour la première fois. La maladie du général Schuyler força ce dernier à retourner chez lui. Peu après le fort Saint-Jean se rendit, et, coïncidence remarquable, celui qui le commandait était ce même major qui, en obtenant une promotion au détriment de Montgomery, avait dégoûté ce dernier du service militaire anglais.

" Chacun sait comment s'opéra la reddition de Montréal.

" Montgomery a toujours été sous l'impression que cette ville aurait pu se défendre plus vigoureusement.

" — Les officiers anglais défilèrent, écrit-il, devant mes troupes, sans que je fisse semblant de les voir. J'en rougis encore pour l'uniforme de Sa Majesté, mais les troupes se rendirent prisonnières dès qu'elles virent quelques pièces en batterie.

" Montgomery voulait passer l'hiver à Montréal. Les troupes étaient en haillons, et l'on n'avait plus de vivres. Les demandes de renforts restaient sans réponse. Le général se démit encore deux fois de son grade, sans pouvoir faire accepter sa démission. Ce fut alors que la marche mémorable d'Arnold à travers les solitudes du Kennebec et de la Chaudière, vint dérouter tous les plans de Montgomery et le mena sur le chemin du sacrifice et du martyre militaire."

Ici ce termine ce manuscrit trop court de Mme Montgomery.

Au moment de son mariage, ce brave soldat était loin de rêver encore aux gloires et aux horreurs de la guerre.

— Mon mari n'a plus qu'une ambition, disait sa femme ; il ne rêve plus que la vie des champs. Il aime sa famille, ses livres, ses rares amis. Il se complaît dans ce petit monde où il est fort prisé et fort aimé. L'agriculture trouve en lui un adepte dévoué. Il partage son temps entre sa ferme et son moulin.

Hélas ! deux ans employés ainsi passent vite. Tout ce bonheur, toute cette tranquillité furent brisés le jour où Montgomery fut député par le comté de Duchesse pour faire partie de la première Convention provinciale[1].

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[1] Ce fut vers ce temps-là que parut un document précieux pour notre histoire. M. Alfred Garneau m'a fait le plaisir de m'en donner ce résumé.

" Lettre adressée aux habitans de la Province de Québec ci-devant le Canada. De la part du Congrès Général de l'Amérique Septentrionale, tenu à Philadelphie.

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Imprimé et publié par ordre du Congrès,
A Philadelphie,
De l'imprimerie de Fleury Mesplet.
M.DCC.LXXIV.

Cette lettre est signée :
" Par ordre du Congrès.
26 octobre 1774.
Henry Middleton, président."

Ce Congrès avait débuté le 6 septembre 1774. Voici le commencement de cette lettre : — elle a 18 pages.

" Aux habitans de la province de Québec. Amis et Concitoyens,

" Nous les *Délégués* des colonies du nouveau Hampshire, de Massachusetts-Bay, de Rhode-Island & des Plantations de Providence, du Connecticut, de la Nouvelle-York, du Nouveau-Jersey, de la Pennsylvanie, des comtés de New-Castle, Kent et Sussex sur le fleuve de la Ware, du Maryland, de la Virginie & des Carolines septentrionale & méridionale, ayant été députés par les habitans des dites Colonies pour les représenter dans un Congrès général à Philadelphie, dans la province de Pennsylvanie, &c., &c."

M. Rodrigue Masson, de Terrebonne, possède un exemplaire de cette lettre.

M. Garneau joint à ce résumé le document suivant. Il prouve jusqu'à quel point nos ancêtres étaient sollicités par le Congrès.

" To Francis Guillot of River Duloup : Gentleman —

" Reposing Especial Trust & Confidence in Your Friendship Zeal & Attachment to the Cause of Liberty &

Peu fait pour la vie politique, Montgomery était un militaire dans toute l'acception du mot. Il ne connaissait qu'une chose, l'obéissance ; il ne se courbait que devant une autre chose, la discipline. Choisi parmi les huit premiers brigadiers généraux, il ressentit profondément toute la responsabilité de cet honneur que lui confiait sa nouvelle patrie, et il se promit d'en être digne jusqu'à la fin.

Mme Montgomery accompagna son mari jusqu'à Saratoga.

Le beau-frère de Montgomery était aussi du voyage. Il avait alors onze ans, mais il conserva toujours le souvenir de cette séparation, et longtemps après Edward Livingston en parlait ainsi :

"— Le moment de se dire adieu était venu. Nous n'étions que trois dans la chambre du général : lui, ma sœur et moi. Montgomery était assis tout rêveur dans un fauteuil.

Relying upon Your Exertions to Oppose & Frustrate the Cruel Designs of a Wicked Ministry form'd against the Lives & Liberties & Properties of the Inhabitants of the Thirteen United Colonies of America which if Carried into Execution must in its Opperation prove as fatal to this & the other American Colonies as those which have already united in Opposition to the Wicked Designs of Administration. I do by Virtue of the power & authority Delegated to me by the Honorable the Continental Congress appoint you the said Francis Guillot to be Captain of an Independant Company of such Brave French Canadians as you may already have or may hereafter Inlist to Act in Concert with the American troops. In Opposition to the Ministerial Army in Canada. You are from time to time to Receive & Obey such Directions as you shall receive from the Commander in Chief, or other Your Superior Officers, the pay of yourself your under Officers & Soldiers to be the same as any other Troops sent here under the Command (sic) & Direction of the Continental Congress: given at Head Quarters at Sorrell the 7th day June 1776.

Jno. Sullivan, Commander of the
Continental forces in Canada.

M. Alfred Garneau annote ainsi ce curieux document: "J'ai trouvé cette pièce entre les feuilles d'un manuscrit in-folio acheté le 15 octobre 1870 à Québec, par moi, chez l'encanteur Park, rue Saint-Jean. Ce manuscrit appartient aujourd'hui à M. l'abbé Verreau, principal de l'Ecole Normale Jacques-Cartier, Montréal."

Le peuple ne répondit guère à ces appels. Il suivit l'exemple du clergé. Je puise encore dans les carnets de M. Garneau la curieuse lettre suivante écrite à Carleton par le vicaire-général, M. de Montgolfier. Elle donne une idée des agissements du temps. Je lui conserve son orthographe :

montreal 21 juin 1776.

Monseigneur

il y a tant de choses a dire, que je me trouve presque obligé a garder le silence, par la difficulté du choix de matieres qui peuvent etre plus intéressantes, ou de celle qui pourroient vous être inconnues, et agreables ou utiles.

ce qui y a dessentiel et de certain cest quaux approches de larmee de Mr. carleton tous les ennemis ont disparu, et se sont retires, je ne scais ou audela du lac champlain. ils ont brulé dans leur fuite, le fort chambly, et les mauvaises baraques de St. jean. les troupes du roy sont en possession du fort St. jean, et il y a une garnison de cinq ou six cent hommes. il n'est pas possible pour le present de poursuivre plus loing les fuyards, parceque le roy na absolument, ny barques ny bateaux sur ce lac. son excellence les avait poursuivi en personne, jusques à quelques lieux au dela de la prairie, mais ayant appris la quil navait plus dennemis a combattre dans cette province (car tous les canadiens sont fideles et braves aujourd'huy). il est tourné du coté de montreal, ou il a fait son entree triomphante hyer a midi jai eu l'honneur de le recevoir et de le complimenter le premier au sortir de son bateau, sur la greve ; et de laccompagner ensuite au travers de toute la troupe, et aux acclamations du peuple, depuis la porte du port, jusques à son hotel, la maison de Mr. deschambaux, ou lencienne intendance, pres de bon secours. je vous envois cy joint copie de mon compliment, un peu plus bas, mais ou il y a du vray. les rejouissances ont continué toute la nuit, pendant laquelle il y a eu une illumination générale.

sans doute que pour la rejouissance ecclesiastique, pour lentiere et prodigieuse delivrance de la province de linfectation des ennemis, votre grandeur nous enverra quelque mandement. il ne me conviendrait pas d'en prevenir le tems, je nay rien fait, et jattendrai vos ordre

jai l'honneur detre avec le plus profond respect
de votre grandeur
Monseigneur
le tres humble et tres obeissant serviteur
Montgolfier.

Sa pensée semblait scruter l'avenir. Un silence douloureux planait sur ma sœur et sur le général, pendant que ma curiosité d'enfant était tout yeux pour admirer le bel uniforme chamarré d'or que portait Montgomery. Tout à coup la voix sonore et grave du général rompit le silence :

" Il récitait la tirade du poète anglais :

— *'Tis a mad world, my masters. I once thought so ; now I know it.*

" Son ton vibrant, son calme, son grand air, me suivent encore, quand je songe à ce jour-là. Je me retirai sans bruit."

Wolfe, la veille de sa mort, récitait à demi voix à son état major l'élégie de Grey, qui se termine par ces mots :

— *Le chemin de la gloire ne conduit qu'au tombeau !*

Montgomery allant lui aussi au sacrifice, résumait toutes les douleurs de cette séparation dans cette citation.

" — Ces paroles furent les dernières qu'il prononça ; depuis je n'ai jamais revu le général, ajoute tristement Edward Livingston."

Montgomery, pendant la campagne canadienne, n'écrivit que neuf lettres à sa femme. En ces temps-là les communications postales entre le Canada et New-York étaient longues et pleines de périls. Par le plus beau temps, un sloop mettait une semaine à faire le trajet entre Albany et New-York. En comparant les dates, on se convaincra que plusieurs de ces missives furent au-delà de deux mois en route.

Voici la première ; elle est datée de l'Ile-aux-Noix, septembre 12, 1775 :

Ma chère Janet,— Je suis tout navré ; mes troupes se conduisent si mal, que je me repens amèrement d'avoir accepté ce commandement. L'autre jour, je descendis la rivière avec 800 ou 900 hommes ; le but de cette petite expédition était de couper les communications entre Saint-Jean et Montréal. Il était nuit quand ce détachement fut conduit aux chaloupes. Moins d'une demi-heure après, il me revint dans le plus grand désordre. Cette panique avait été causée par quelques traînards qui faisaient quelque bruit dans les broussailles. La première ligne se débanda et entraîna les autres dans sa fuite. Ils sautaient commes des moutons ; je ne saurais dire si quelques-uns d'entre eux ont résisté à la couardise, mais ce que je sais, c'est que tous se sont conduits plus ou moins mal.

A force de prières, de menaces et de reproches, je les forçai à rebrousser chemin et à regagner les embarcations. Une heure après, ils me revenaient avec la même frayeur et la même rapidité.

Dans une de mes dernières excursions, mon avant-garde a surpris dans une cabane un officier canadien et quelques Indiens ; cet officier et un Indien furent tués, mais les autres ayant riposté quelques coups de fusil, tout mon monde s'est mis à tirer à tort et à travers. Sur quoi ? sur qui ? sur rien !

Mais revenons à mes chaloupes. L'officier commandant était Ritzma. Il me démontra toute l'impossibilité de faire marcher ses gens. Le matin suivant, j'essayai de les persuader de nouveau, mais sans le moindre succès. Pour résumer, jamais de ma vie je n'ai vu une collection plus complète d'aussi lâches misérables (*pusillanimous wretches*). Ah ! si je pouvais, sans éclabousser mon honneur, laisser aujourd'hui cette armée, je ne resterais pas ici une heure de plus. J'ai grand peur qu'on ne nous ait représenté bien que trop exactement le caractère de ce peuple. Néanmoins, il y a ici certains hommes qui m'inspirent de la confiance. Ils s'occupent beaucoup du soldat, de son instruction, de son bien être, et tous ces soins me laissent sous l'impression qu'ils peuvent réussir à en faire des hommes. Le pis c'est que nous sommes assez malheureux pour avoir des Canadiens qui sont témoins de toutes ces hontes ! Que vont-ils penser des *braves Bostonais ?* Je n'en sais rien. S'ils les jugent comme moi, ils ne sont pas prêts à mettre leur confiance entre les mains de pareils amis.

Vous ne montrerez cette lettre qu'à votre père. Elle desservirait à coup sûr notre cause, si elle était lue par d'autres ; et il faut cacher nos faiblesses.

Puissé-je dans ma prochaine vous donner de meilleures nouvelles !

Adieu, ma très chère Janet,

Croyez-moi, votre très affectueux,

RICHARD MONTGOMERY.

Quel contraste entre cette lettre de Montgomery appréciant ainsi ses troupes, et ce billet, écrit en français, que le lieutenant-colonel MacLean adressait quelque temps après à ses officiers. M. Alfred Garneau me permet de le citer en entier, avec ses fautes d'orthographe. Il n'en a que plus de saveur :

MONSIEUR, —

Comme on vient de me dire qu'il y a plusieurs parties de plaisir parmi la millice canadienne ce soir. Ayez la bonté d'envoyer un officier de confiance a chaque maison ou on tien Balle les obliger de prendre leurs armes et leur Gargousses avec eux pour etre pret en cas de besoin a défendre leurs Maitresses et leurs Biens. J'espere que vous ferez exécuter cet ordre comme il faut. J'ai l'honneur d'etre

Monsieur, votre tres humble serviteur

ALLAN MACLEAN,
Lieut.-Col. Commandant.

Quebec 19 fevrier 1776.

Adrressée à :

A Monsieur
Monsieur le Major Baby.

La seconde lettre de Montgomery n'est pas écrite sur le ton désespéré de la première, que je viens de citer : elle n'est pas rassurante pourtant.

ILE-AUX-NOIX, SEPT. 5, 1775.

TRÈS CHÈRE JANET,

Je saisis la première occasion pour vous dire que ma santé est bonne. J'ai poussé une pointe sur Saint-Jean, avec le petit corps d'armée que j'ai amené avec moi de Ticonderoga. Là nous avons trouvé le navire ennemi monté de seize canons, tout prêt à mettre à la voile. Nous n'avions que deux pièces d'artillerie sur affût, ce qui n'était pas suffisant pour mettre le siège devant la ville ou pour essayer de détruire le vaisseau anglais qui était sous la protection du fort. On en revint alors à l'adoption d'un projet qui avait déjà réuni l'assentiment de la majorité, celui de jeter une estacade sur le chenal à l'Ile-aux-Noix. Nous sommes à la veille de terminer ces travaux. Nous ne savons pas encore à quoi nous en tenir sur l'attitude que les Canadiens vont prendre vis-à-vis de nous. Néanmoins un M. Hazen, résidant à Saint-Jean, qui me paraît être un homme de jugement, est d'avis qu'ils ne prendront pas les armes contre nous, mais qu'ils ne prendront pas non plus l'offensive en notre faveur. Quand nous serons sûrs de leur amitié et que toute défiance aura disparu, nous lancerons de forts détachements dans l'intérieur du pays, et nous nous en rendrons maîtres, si toutefois M. Carleton ne reçoit pas de renforts.

Nous avons eu une escarmouche avec les Indiens ; deux de nos meilleurs officiers ont été blessés, et neuf ou dix de nos soldats ont été tués. Tout a été confusion et cohue dans cet engagement. Les soldats de New-York ne savent pas se battre sous bois, tandis que les gens du Connecticut s'en sont bien tirés pour la plupart ; mais vers le soir, l'ennemi lança quelques bombes sur nous, et il y eut alors une panique qui me déplut fort. A force de voir le danger, ils finiront, je l'espère du moins, par s'y habituer.

Le général crut prudent de donner l'ordre de s'éloigner un peu avec les embarcations et les chaloupes. L'embarquement se fit dans le plus grand désordre, et la seule excuse possible pour pallier ce fait, c'est que nos troupes n'étaient composées que de conscrits. Je leur ai fait honte ; du moins j'ai essayé de mon mieux. Pourvu que ce scandale ne se renouvelle plus ! Ils me font l'effet de me craindre. Tant mieux.

Ce pauvre Schuyler est tellement malade, qu'il est devenu un objet de compassion et de pitié pour tout le monde.

Je vous ai écrit de la Pointe-à-la-Chevelure, ainsi qu'à votre digne père. Faites-lui lire cette lettre ; elle est pour vous deux, car je suis trop pressé de besogne pour en écrire une autre. En cas d'accident, et si par hasard on faisait circuler à Albany le bruit qu'il me serait arrivé quelque chose de fâcheux, je donne l'ordre à Walter Livingston de vous envoyer cette lettre par l'express.

Adieu, ma très chère Janet. Comptez toujours sur ma vive affection.

RICHARD MONTGOMERY.

La troisième lettre est datée du camp sous Saint-Jean, le 6 octobre 1775.

MA CHÈRE JANET,

C'est dans la plus profonde des anxiétés que je vous écris ; une lettre de votre père me dit que vous êtes malade. Pourquoi n'a-t-il pas gardé pour lui-même cette triste nouvelle ? Je suis assez malheureux sans cela.

Tous mes vœux sont pour votre prompte recouvrance.

Il y a peu de changements ici, depuis ma dernière lettre. J'attends toujours des renforts. Il m'en est venu, mais ces troupes tombaient de suite malades, et elles rentraient au pays à mesure qu'elles arrivaient. Depuis assez longtemps nous sommes comme des rats à demi noyés ; nous mangeons, nous dormons, nous marchons, nous nous traînons dans un marécage. Heureusement le temps s'est mis au beau et nous faisons des vœux pour que cela continue.

La Corne de Saint-Luc et quelques citoyens influents de Montréal vont me faire certaines propositions. Saint-Luc est roué, et madré, mais je veux lui damer le pion en envoyant un *New-Englander* traiter avec lui.

Si nous avions le triple ou même le double des troupes que nous commandons ici, tout serait fini depuis longtemps. La basse classe du peuple veut notre succès, mais nos faiblesses, nos terreurs, notre manque de discipline les déroutent complètement. De plus, ils craignent les représailles des leurs quand nous serons partis.

Je suis chagrin d'apprendre aussi que votre mère et votre père sont malades. J'espère qu'ils seront en bonne santé quand cette lettre vous parviendra. Mon affection est toujours autour de vous tous, ainsi qu'auprès de votre grand-père.

Adieu, ma chère Janet ; croyez moi pour toujours à vous.

RICHARD MONTGOMERY.

La lettre suivante nous révèle un côté du caractère du général américain :

CAMP SOUS SAINT-JEAN, OCTOBRE 9, 1775.

Je reçois ce soir, chère Janet, trois lettres qui vont jusqu'au 23 septembre. Elles m'annoncent l'agréable nouvelle de votre retour à la santé. J'espère bientôt en recevoir d'aussi bonnes sur le compte de votre père et de votre mère.

Vous avez raison, j'aurais pu donner à votre frère Henri une promotion de major. Tant que je vivrai, j'espère que le désintéressement et la générosité que l'on doit aux étrangers m'empêcheront de faire du népotisme et de servir ma famille ou moi-même aux dépens du public. Henri est un beau soldat, plein d'élan, mais il n'a pas l'expérience qu'exige un pareil grade. J'admets avec vous qu'il y

a des officiers dans ma brigade qui valent bien moins et pis encore, — mais je ne transigerai jamais avec ma conscience.

Je vous ai toujours fait un aveu qui pour moi est une grande vérité. Je suis tout à fait incapable de prendre de l'autorité sur l'humanité prise en bloc ; c'est pour cela que j'aime tant la vie tranquille, et que je ne demande qu'à quitter le service. Je suis trop sensible : personne plus que moi ne ressent autant la canaillerie, l'ignorance et l'égoïsme qu'à chaque instant on retrouve chez ses semblables. Tout ce que je peux faire c'est de retenir ma colère quand j'ai affaire à de pareilles gens.

On m'a fait sortir de mon heureuse obscurité sans me consulter. J'ai même combattu longtemps l'idée de me mettre ainsi en évidence. Vous le savez mieux que personne. Aussi, croyez-moi, dès que je pourrai, sans forfaire à l'honneur, me décharger du poids qui me pèse, je retournerai à mon foyer, à ma famille, à ma ferme, et je jouirai sans ostentation, à plein cœur, de cette paix que je ne saurais trouver dans la position que j'occupe en ce moment.

Le général Schuyler peut revenir dans quelques jours. Son retour à Ticonderoga a été une très heureuse affaire. Autrement nous aurions été obligés de faire retraite, à demi morts de faim, et de laisser les malheureux Canadiens à eux-mêmes. La Providence fait beaucoup pour nous, quand nous faisons si peu pour nous-mêmes.

Les pourparlers avec de Saint-Luc n'ont abouti à rien. Le gouverneur a dû avoir vent de l'affaire. Saint-Luc qui se sentait compromis a fait remettre ma lettre au gouverneur même, par un courrier indien. Carleton donna aussitôt l'ordre de la brûler sans la lire. En faisant cela, peut-être voulait-il, ne pas avoir un prétexte pour traiter sévèrement de Saint-Luc.

L'expédition du Kennebec me rend anxieux. Si elle réussit, elle frappera un grand coup. Nous sommes sans poudre, et si l'on ne nous en envoye pas, la campagne sera longue, car il faudra prendre l'ennemi par la faim.

Puisque vous le désirez, gardez votre dame de compagnie française. Henri se porte à merveille, ainsi que les deux officiers que vous mentionnez dans votre lettre. Willett a été malade.

Je vous écris de ma tente, assis auprès d'un bon feu. C'est la première belle journée que nous ayons eue depuis longtemps. Je n'hivernerai pas dans les forts. Il est possible que je sois obligé de rester au Canada ; mais, si la chose est en mon pouvoir, j'irai certainement vous rejoindre.

Tous mes bons souhaits pour votre grand-père. Mes amitiés aux fillettes.

Adieu, ma chère Janet, croyez-moi votre très affectueux,

RICHARD MONTGOMERY.

Dans sa cinquième lettre, il annonce une victoire :

MONTRÉAL, 13 novembre 1775.

MA CHÈRE JANET,

Les Bostonais sont entrés ce matin dans la ville. Depuis deux nuits déjà, le gouverneur et sa faible garnison l'avaient abandonnée. Ils retraitent vers Québec, où ils courent une chance d'être pris par Arnold, qui est dans le voisinage de cette ville.

Je fais appel à toute ma vertu et à toute ma patience pour tenir tête à la légion de femmes qui ne cessent de m'importuner au sujet de leurs maris ou de leurs frères faits prisonniers.

Vous pouvez vous fier à moi : aussitôt que toutes ces affaires seront débrouillées, je retournerai au pays. Nous vivrons heureux sur notre propriété. Je me porte à ravir et j'ai bien hâte de vous revoir.

Adieu, ma chère Janet,

Croyez à ma sincère affection.

RICHARD MONTGOMERY.

La sixième lettre de Montgomery parle encore des probabilités de son retour. Cette idée hante constamment son cerveau. Il y pense nuit et jour.

MONTRÉAL, 24 novembre 1775.

MA CHÈRE JANET,

Henri a dû vous porter une lettre, et il a dû aller vous faire visite. J'ai bien hâte de vous voir dans votre nouvelle maison. Si l'hiver est hâtif, n'oubliez pas de donner ordre d'enclore le jardin avec une clôture de lattes, clouées sur des pieux en chataigniers. Faites aussi monter un poële dans la salle ; il n'y a rien de plus délicieux au monde que de se chauffer ainsi en famille, en écoutant pétiller les bûches sous le feu dévorant.

L'autre jour, le général Prescott a été assez complaisant pour se rendre à nous, en compagnie de seize officiers de l'armée de terre, de cent hommes et d'un certain nombre de matelots et d'officiers de la marine. J'en ai rougi pour les troupes de Sa Majesté ! Je n'ai jamais été témoin d'un pareil acte de couardise. Et cette reddition s'est faite parce que nous avions sur la rive une demi-douzaine de canons en batterie qui pouvaient molester la retraite !

Le gouverneur s'est échappé, mais Prescott est de bonne prise. Je l'ai traité avec le profond mépris que méritent sa cruauté et sa barbarie.

Demain, j'espère être en route pour Québec, où je ferai une jonction avec Arnold. Il est important de nous voir. Sa petite armée a enduré les fatigues les plus extraordinaires. Elle a fait une marche mémorable, tout en crevant de faim et en étant à moitié nue. Si la fortune continue à nous sourire, notre besogne sera bientôt terminée. En attendant, adieu !

Croyez-moi votre très affectueux,

RICHARD MONTGOMERY.

P. S. — Je n'ai pas le temps d'écrire à votre père. La besogne me déborde et ma patience est à bout. Nous perdons tous notre temps — et un temps précieux — dans cette ville.

Tous mes meilleurs souhaits à vos parents ; mes amitiés aux fillettes. Vont-elles à la ville ? Y a-t-il des maris cet hiver ? Hélas ! Je ne vis que dans l'espérance de vous rejoindre dans six semaines.

Voici la dernière lettre de Montgomery :

HOLLAND HOUSE, près Québec, 5 décembre 1775.

MA CHÈRE JANET,

J'ai eu aujourd'hui le plaisir de recevoir votre lettre datée du 13 octobre. Comme elle a été longtemps en route ! Je commence à croire que j'ai le droit de me plaindre, car vous ne m'écrivez plus aussi souvent que jadis.

Je vois d'ici nos gens des colonies réunis. Comme ils doivent s'en donner ! N'est-ce pas que nous sommes tous le sujet de leurs conversations ? Je voudrais voir la tête de mes amis les *Loyalistes ;* ils doivent avoir la figure longue. Et nos patriotes, comme ils doivent jubiler !

Le temps est toujours au beau, si beau même que nous avons descendu par eau, de Montréal à Québec, notre artillerie et nos provisions. En ville, on est sur le qui-vive, et avec raison. Carleton, nous dit-on, ne peut compter entièrement sur sa petite garnison, et le nombre de ses troupes ne suffit pas pour couvrir l'étendue de ses fortifications. Je voudrais de tout mon cœur que cette guerre fût terminée, et je soupire après mon humble chez moi de la Nouvelle-Angleterre.

Certes, je n'oublierai pas notre descente de lit en peau de castor, et si je me retire sain et sauf de cette expédition j'y joindrai des peaux de martre pour votre mère. Présentez-lui mes respectueux hommages, et dites-lui de ne pas se monter la tête à propos de Henri. Il ne m'a nullement offensé ; il m'a seulement causé quelque inquiétude en commettant une légère imprudence. Je suis heureux d'apprendre que notre maison est à la veille d'être terminée. Puissé-je avoir la joie et la consolation de vous revoir bientôt !

Jusqu'à cet heureux moment, adieu !

Croyez-moi votre affectueux,

RICHARD MONTGOMERY.

" Jusqu'à cet heureux moment, adieu ! " tels furent les derniers mots de Montgomery à sa femme. Vingt et un jours après avoir écrit cette dernière lettre, il mourait au champ d'honneur !

II

La santé du général Schuyler l'avait forcé à remettre son commandement entre les mains de Montgomery, ainsi que l'indiquaient les lettres de ce dernier. L'insubordination régnait parmi les troupes placées sous ses ordres.

Les recrues de la Nouvelle-Angleterre lui causaient les plus grandes anxiétés :

" Ce sont les plus tristes soldats que j'aie vus au monde, écrivait-il. Les meilleurs sont atteints de nostalgie. Leurs régiments se fondent et disparaissent à vue d'œil, sans qu'il y ait eu parmi eux un seul homme tué au feu. Ils sont tellement arrogants que leurs officiers n'ont pas la moindre autorité sur eux. Il n'y a que très peu de personnes parmi ces gens-là à qui je puisse me confier. Toutes ces recrues se croient des généraux et non pas des soldats. Elles sont tellement jalouses, tellement envieuses, qu'il est impossible, même quand on risque sa tête chaque jour, de ne pas être soupçonné de trahison par elles."

Voilà le jugement que Montgomery porte sur ses propres troupes.

Un autre jour, il écrit à l'un de ses amis :

" Heureux le paysan qui se tient aux mancherons de sa charrue ! Je donnerais tout au monde, en ce moment, pour être dans mon champ et respirer l'âcre parfum des labours ! "

Malgré ce dégoût personnel que le général avait pour son corps d'armée, il n'y a pas à se cacher que jusqu'à ce moment la marche de Montgomery avait été une promenade triomphale.

" J'ai fait un doigt de cour à la fortune, écrit-il à un autre ami, et elle m'a sauvé. Je n'ai plus qu'une seule faveur à lui demander, et ma mission sera finie auprès d'elle."

Cette faveur, c'était la prise de Québec ; hélas ! elle devait lui donner la paix de la tombe.

Quelques jours avant de tenter l'assaut, il causait avec un de ses aides de camp.

— La fortune, lui disait-il, se donne aux braves !

Puis il se mit à parler de sa jeunesse, de son passé :

— Je n'ai plus d'ambition, je n'ai plus que le sentiment du devoir. Quand j'aurai fait ce que ma consigne m'ordonne, je retournerai avec plaisir à la vie des champs. Je suis fait pour la verdure, le bruit des ruisseaux, le calme des prairies, la vie des plaines ondoyantes couvertes de blés jaunis, la senteur du foin, les paysages argentés. Néanmoins, si l'occasion s'en présentait de nouveau, je n'hésiterais pas à quitter encore cette félicité champêtre pour mettre mes humbles connaissances au service de ma patrie.

Et se tournant vers Québec, il ajouta : — Nous allons réussir, malgré tous les périls qui nous environnent ; je me sens tout espérance, et mon âme déborde de courage et de résolution.

On était au 31 décembre 1775. Le corps d'armée de Montgomery était presque nu ; il était affamé. A ses hommes rangés en bataille, Montgomery tint ce langage :

— Soldats de New-York, vous n'aurez pas peur de suivre votre général partout où il vous conduira. — En avant ! marche !

Et enveloppés dans une tempête de neige terrible, ils marchèrent jusqu'auprès de la barrière de Près-de-Ville.

Pendant ce temps-là, Arnold avec son contingent se glissait du côté de Saint-Roch, avec mission d'enlever les barricades et l'artillerie du Saut-au-Matelot; Livingston dirigeait une fausse attaque contre la porte Saint-Jean ; le major Brown en faisait autant du côté de la Citadelle.

A quatre heures du matin, toutes les colonnes ennemies étaient parvenues au rendez-vous assigné. Rien dans Québec ne décelait qu'on s'était aperçu de l'approche de l'ennemi. Rien au dehors n'indiquait à l'ennemi que l'éveil était donné, et que partout nos postes avaient été doublés.

Tout à coup deux fusées montèrent dans le ciel noir, et ce fut le signal.

Alors la ville s'enveloppa comme dans une ceinture de fer et de feu.

La porte Saint-Louis tremblait sur ses gonds, le Saut-au-Matelot versait la mitraille sur Saint-Roch. La porte Saint-Jean s'éclairait de sinistres lueurs. Une pluie de balles et de boulets s'engouffrait par la rue Champlain ; et, frappant les rocs et les aspérités du cap Diamant, il pleuvait projectile sur projectile.

Québec, tout rajeuni, sentait couler fièrement son sang de sa veine large et généreuse, et retrouvait enfin son indomptable ardeur militaire.

La canonnade mêlait ses notes basses aux crépitements de la fusillade : la mort semblait planer suspendue au bout de l'aile de la tempête, qui passait toujours, emportant l'année qui finissait, et mêlant à la poussière des vanités évanouies beaucoup de sang et beaucoup de sanglots.

Il en fut ainsi jusqu'au point du jour ; puis tout redevint paix et silence.

Québec était sauvée.

Dans la journée, on déblaya la neige autour des morts.

Au pied de la barricade de Près-de-Ville, on trouva le général Montgomery, ensanglanté et roidi par le froid. A leur poste de combat, près de lui, étaient les cadavres de ses deux aides de camp.

Près-de-Ville était sous les ordres du capitaine Chabot, de l'artillerie canadienne-française. Il avait commandé le feu et le même coup de mitraille avait foudroyé le général, son état major et tout le peloton d'avant-garde[1].

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[1] L'infatigable chercheur, M. Alfred Garneau, me communique les renseignements suivants sur ce qui s'est passé pendant cette nuit mémorable. Ces notes semblent être de l'écriture de M. Berthelot d'Artigny.

" 31 déc. 1775. Saut-au-Matelot.

" A la maison de Mr Traiman, ci devant de Mr Sauvageau du coté nord, était la 1re barrière au nord-est du Saut-au-Matelot : les Américains n'y trouvèrent qu'une sentinelle, c'était un matelot qui ayant inutilement appelé la garde, faute de mèche, mit le feu à un canon avec l'amorce de son fusil. Comme il se proposait de tirer encore les Américains le tuèrent à coup de lances. Son coup de canon ne porta pas à faux, car le guide des Américains qui était un Canadien fut tué.

" Le passage sous la maison de Pierre Paquet est l'endroit où les Américains délogèrent une garde enivrée, qui se tenait dans la maison à l'ouest d'Antoine Paquet, alors appartenant à un nommé Bernier. Cette garde était composée d'Anglais. Au coin ouest de la maison de Dubé, maintenant appartenant à Mr Jacques Voyer, était une barrière que défendait le capitaine Alexandre Dumas, français d'origine. C'est au coin sud-ouest de cette maison que le capitaine d'Ambourgest est entré. Il y avait une palissade en cet endroit jusqu'au quai de Mr Adam Lymbourner, alors absent et retiré avec beaucoup d'Anglais dans l'île d'Orléans.

" Il y avait une batterie au coin nord-est de la maison de ce Mr Lymbourner, sur un quai où combattit vaillamment Mr. Dalay, qui eut la langue coupée par une balle des Américains logés les maisons du Saut-au-Matelot. Dubé y eut le nez coupé par une balle. Il y avait un corps de garde ou un piquet chez Mr. Adam Lymbourner.

Carleton qui avait une estime profonde pour Montgomery, le fit enterrer avec les honneurs militaires.

Le 30 août, le général américain avait fait un testament, en passant à la Pointe-à-la-Chevelure. L'authenticité de cette pièce est attestée par la signature de Benedict Arnold.

La voici :

Volontés dernières et Testament de Richard Montgomery.

Je lègue et donne, pour son propre usage, à ma sœur lady Ranelagh, résidant dans le royaume d'Irlande, toute ma fortune personnelle. Elle en disposera à sa guise, mais elle ne touchera pas aux legs mentionnés plus loin.

Toutes mes dettes légitimes devront être strictement payées.

Je lègue et donne aussi à ma sœur lady Ranelagh ma propriété de Kingsbridge sise près de New-York. Elle en disposera à sa guise.

A ma chère et tendre femme Janet Montgomery, je lègue et donne mes meubles, mes instruments

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Cette maison était occupée par Mr William McNider, pendant que Mr Lymbourner était à l'île d'Orléans, comme nous venons de le dire.

" 31 décembre 1775. Près-de-Ville.

" Au hangar de Mr Anthony Anderson, qui alors appartenait à l'honorable Harrison, était la première barrière de ce côté de la ville, mentionné par Mr René. Il y en avait pourtant plusieurs autres dans la basse ville, mais on ne les mentionne pas parce qu'elles n'ont pas figuré en ce jour par aucun acte militaire. A la potasse de Mr Price était le corps de garde et un peu à l'oust la palissade. Cette maison maintenant appartient à la succession de la famille Bréhaut. A l'extrémité ouest était un grand hangar où il y avait deux pièces de canon dans le grenier, portant droit sur la plateforme ou le chemin. Il y en avait deux, sous la palissade, un cinquième canon dans une petite bâtisse au bout de la maison, et le canon était à la disposition des miliciens canadiens. Il y avait à l'ouest, à environ vingt pas du corps de garde, une autre palissade, par une des embrasures de laquelle le chien mentionné dans la narration de Mr René entra.

" Plus loin encore à l'ouest, environ cent trente pas, était la barrière ou les deux pieux ou pointes de la barrière mentionnés par Mr René, furent inutilement coupés."

L'envoi de ce premier document était accompagné des remarques suivantes, faites par M. Alfred Garneau :

" En vidant un tiroir ou j'avais à la longue accumulé de quoi faire une botte de paperasses, j'ai trouvé cette petite note, que j'avais griffonnée à Québec, après une conversation avec le Dr Wells, le 16 septembre 1872 :

Lundi, 16 sept. 1872.

" Le Dr Wells, qui soigne ma sœur toute souffreteuse depuis le printemps, et qui n'est pas seulement un bon médecin, mais un causeur fort renseigné, a connu autrefois une veuve Gagné (Marie Marc) née vers 1761 ou 1762. A l'époque du siège de Québec par les Bostonnais, ses parents demeuraient à Près-de-Ville, à peut-être quatre arpents en deça de la barricade élevée près de la barrière. Leur maison était la dernière habitation de ce côté. Le matin du 1er janvier, une forte détonation ébranla tout à coup les vitres, et les femmes qui se trouvaient seules, réveillées en sursaut et saisies de frayeur, coururent se cacher dans la cave, sous des cuves. Au petit jour, un vieillard vint frapper à la porte, et leur dit qu'on avait tiré sur les Bostonnais à toute mitraille. Lorsqu'il fit grand jour, des miliciens partirent en éclaireurs pour examiner le chemin. Il tombait une grosse neige épaisse. La veuve Gagné racontait qu'à une petite distance de la barricade, ils avaient vu un bras roidi sortant d'un amoncellement de neige ; ils déblayèrent et découvrirent un cadavre, puis un autre .... Ils retirèrent ainsi de sous l'épais linceul blanc qui les avait recouverts durant les dernières heures de la nuit, tant de morts qu'on en remplit dix-huit traîneaux.

" Une des femmes, qui était avec Marie Marc, reconnut parmi eux un Canadien du nom de Desmarais, marchand de la basse ville, proche l'église.

" Elle disait encore, au sujet de Charland, qui s'était distingué un peu plus tard, qu'il avait reçu en récompense une *jolie somme d'argent ;* mais qu'il n'avait pas reçu de distinction parce qu'il était *taré*, ayant été marqué d'un fer rouge à la main pour un méfait.

" La veuve Gagné est morte à l'âge de quatre-vingts ans ou environ, dans la pleine jouissance de ses facultés mentales, particulièrement de sa mémoire. Elle avait eu une certaine instruction, et s'exprimait bien, dans un langage correct. Son père était né en France."

agricoles, mes chevaux, mes bestiaux, mes actions de banque, mes livres. Je joins à ces dons ma montre et mes instruments de physique, d'astronomie et de mathématique.

Je lègue et donne aussi à ma chère femme ma propriété de Rynbeck, avec les chevaux et tout ce qu'il peut y avoir, à l'époque de ma mort.

La belle fortune que ma femme aura plus tard me dispense de lui en donner plus, de lui en donner autant que le voudrait tout mon amour pour elle.

La nombreuse famille de ma chère et pauvre sœur va absorber tout ce que j'ai pu économiser. Je recommande vivement à ma chère femme, Janet, un ou deux des plus jeunes enfants de lady Ranelagh.

Je prie l'honorable Robert Livingston, mon très honoré beau-père, et son fils mon beau-frère, en qui j'ai la plus grande confiance, de veiller à ce que ces volontés dernières et ce Testament, qui sont miens, soient exécutés à la lettre. Il peut se faire que la pression que fait sur moi en ce moment la chose publique et mon peu de connaissances légales rendent cette pièce incorrecte ou obscure, mais mes ordres sont précis, et j'aime à croire qu'ils seront exécutés en conséquence, sans que l'on tente de se prévaloir des exigences techniques de la loi.

Mes frères que je respecte et que j'affectionne tant, se contenteront de ce qu'il me reste à leur donner : mes vœux les plus ardents pour leur bonheur.

(Signé) RICHARD MONTGOMERY.

Témoins : { ROBERT WALKER. EDWARD MOTT. J. I. TÉTARD.

"Crown Point," août 30 1775.

Ceci est pour certifier que les présentes volontés dernières et le présent testament du défunt général Montgomery ont été trouvés parmi ses papiers, quelques jours après sa mort, et que nous y avons de suite apposé les scellés.

BENEDICT ARNOLD.
DONALD CAMPBELL.

Ces lignes sont écrites et signées de la main du général Arnold.

Le testament fut prouvé et enregistré au bureau du " *Surrogate* ", à Poughkeepsie, le quatrième jour d'août 1781.

Le général Montgomery n'a pas laissé de descendants.

Cette ferme de Kingsbridge mentionnée dans son testament était voisine de New-York. Elle contenait soixante et sept acres, et s'étendait sur la ligne de division qui sépare les Yonkers de Fordham. Ce fut sur une partie de cette propriété que l'on construisit plus tard le fort Indépendance. Pendant la guerre de la Révolution, la maison de Montgomery fut démolie, les vergers furent dévastés et brulés ainsi que les arbres de haute futaie : les clôtures servirent aux feux de bivouacs, et la terre elle-même fut employée à élever des fortifications passagères.

Aujourd'hui la propriété de Kingsbridge a une valeur de plusieurs millions.

Montgomery était surtout un financier et un homme d'ordre. Ses plus petites dépenses étaient notées au jour le jour. Il avait prit cette habitude dès sa plus tendre enfance ; aussi n'avait-il jamais manqué d'argent.

A sa mort on trouva dans ses cantines les sommes et les effets suivants ; ces derniers furent presque tous achetés par le général Arnold :

Inventaire des effets et autres choses du défunt général Montgomery, dressé à l'Holland House le 2e jour de janvier 1776, en présence du colonel Donald Campbell, du major F. Wissenfelts, du major Mott, Ogden, du révérend John I. Tétard, et de Aaron Burr, aide de camp.

$111 dollars en billets " *Continental* ".

15 chelins, argent légal du Connecticut.

Un sac, contenant 45 reçus pour une valeur de 5,740 louis, neuf chelins et 3 pence half-penny, argent legal de New-York. Dans ce même sac il y avait une ceinture de *wampum* blanc (*rasade*).

78 (half Johannes.)

¼ d'un (Johannes.)

2 pistoles.

50 (half Joes.)

193 chelins anglais.

Six demi-couronnes anglaises.

20 piastres espagnoles, neuves.

4 chelins — 10 cents en menue monnaie.

Total, £347.47

Le 3 janvier fut ouverte une valise noire, en présence du colonel Donald Campbell, du major John Brown, du major Fred. Weissenfelts et d'Aaron Burr, aide de camp. Elle contenait:

17 chemises avec manchettes, dont 3 ont été vendues au général Arnold.

6 chemises vendues de 4 à 8 dollars.

10 cravates en batistes ; 6 vendues à Arnold.

6 id en mousseline.

1 id en soie, vendue à Arnold.

9 paires de bas de soie.

3 id en fil.

3 id en laine (une paire à été donnée au nègre Dick.)

7 mouchoirs en toile et 2 en soie; vendus à Arnold.

2 bonnets de cottons.

3 pantalons blancs.

2 gilets blancs de Hollande.

2 pantalons de Nankin.

1 gilet et un pantalon en casimir ; vendus à Arnold.

1 paire de mitasses indiennes, fort belles, vendue à Arnold.

1 paire de mocassins, vendue à Arnold.

1 vieille redingote blanche.

1 paire de draps (donnée à l'hôpital).

2 taies d'oreillers.

1 paire de souliers en cuir et deux paires en toile.

2 paires de boucles d'argent.

1 douzaine de couteaux et de fourchettes, vendues à Arnold.

1 paire de demi-bottes avec boucles d'argent.

1 paire d'éperons.

1 paire de gants.

1 manteau brun, de patrouille.

6 cuillères à table, en argent ; vendues à Arnold.

6 cuillères à thé.

6 cuillères à table en argent, et des pincettes à sucre en argent, empruntées à Montréal, remises à Arnold.

5 rasoirs.

1 boîte à toilette, 1 peigne en écaille de tortue.

Il y avait à part :

1 matelas et deux oreillers.

2 couvertures, 1 courte-pointe, vendues au colonel Warner.

1 robe en buffle, 1 brosse à habit, vendues à l'aide de camp Burr.

1 porte-manteau de selle, remis au major Ogden.

1 vieille valise, 5 nappes de table, vendues au général Arnold.

Le produit de cette vente rapporta £19 8s. 6d. Montgomery laissait aussi quelques volumes. C'étaient les *Rêveries* du maréchal de Saxe, les premiers et deuxième livres de Polybe, l'*Ingénieur de Campagne* de Clarroc, les volumes 3, 7, 8 et 10 de la *Science militaire*, et le dictionnaire anglais de Johnson.

Ils furent remis, sur autorisation du général Schuyler, au colonel Ed. Antil, qui en donna reçu.

L'inventaire est certifié par Donald Campbell, assistant quartier-maître général, par Mott, Ogden, J. I. Tétard, Fred. Weissenfels, M.B.

La note suivante se trouve au bas de l'inventaire :

" Sur la demande du colonel Donald Campbell, le gouverneur Carleton a fait remettre la montre et le cachet du général Montgomery. Le colonel Campbell a confié ce précieux dépôt à MM. Jeffries et Minott avec ordre de le remettre à Montréal au général Wooster. Ces bijoux ont été envoyés de là au lieutenant-colonel Ritzma à New-York, qui les a fait tenir à Mme veuve Montgomery avec une copie certifiée de l'inventaire citée plus haut[1].

On trouva aussi dans les papiers de Montgomery les notes suivantes sur les chiffres de la garnison de Québec :

GARNISON DE QUÉBEC, 1775.

Emigrants de McLean	200
Septième régiment de fusiliers	60
Matelots	500
Milice anglaise	300
Milice française	700
	1760

Montgomery fut enterré près du Garrison Club, dans la cour de cette maison qui est à droite du chemin de ronde qui mène à la citadelle. Une pierre, sans inscription, indique encore l'endroit où pendant quarante-trois années reposèrent, sous la garde du vainqueur, les restes du glorieux vaincu.

En 1818 la législature de New-York vota unanimement et d'urgence la loi suivante :

Acte pour honorer la mémoire du général Richard Montgomery :

Attendu que le général Richard Montgomery, un citoyen de cet Etat s'est distingué par sa valeur, par son patriotisme, parmi les premiers héros du temps de la Révolution, et qu'il a été tué en donnant bravement l'assaut à Québec ; attendu que les restes du dit général Richard Montgomery sont enter-

[1] Mon ami, le savant docteur Coyteux-Prévost, d'Ottawa, possède une vieille montre en or qui lui vient de l'un de ses oncles. Sur le boitier on voit finement ciselée, la scène de la mort du général Montgomery.

rés non loin du champ de bataille, et qu'ils ne sont indiqués par aucun signe de respect extérieur; attendu qu'un monument a été élevé à sa mémoire et à celles d'autres officiers dans l'église de Saint-Paul de la ville de New-York, par ordre du Congrès des Etats-Unis;

Il est résolu par le peuple de l'Etat de New-York, représenté par son Sénat et par son Assemblée, que la personne qui est pour le moment chargée du soin de gouverner cet Etat, soit et est par les présentes autorisée à prendre toutes les mesures qu'elle jugera convenables et nécessaires pour obtenir le consentement du gouvernement du Canada, à la translation des restes du général Richard Montgomery, de Québec à New York, pour qu'ils soient déposés dans l'église de Saint-Paul, près du monument consacré à sa mémoire, et que cette translation et toutes dépenses encourues pour exécuter cet ordre, soient à la charge de l'Etat de New-York.

Un double de cet acte, paraphé et certifié, fut envoyé par le gouverneur Clinton à la veuve du général. Il était accompagné de cette lettre:

ALBANY, 4 mars 1818.

MADAME,

J'ai l'honneur de vous adresser l'acte intitulé: "Acte pour honorer la mémoire du général Richard Montgomery." C'est avec le plus profond respect que je choisis cette occasion pour vous dire que je me soumettrai en tout à vos sentiments et à vos désirs.

Tout ce qui pourra, dans une circonstance aussi solennelle, être suggéré par votre délicatesse et la religion de vos souvenirs, sera respecté, et je m'efforcerai de tout conduire de manière à honorer celui qui fut votre glorieux mari, en suivant les ordres de l'Etat, qui n'oublie pas l'un de ses plus illustres fondateurs.

Avec le plus profond respect,
J'ai l'honneur d'être votre obéissant serviteur,

DEWITT CLINTON.

Mme Montgomery fut profondément touchée par cette lettre. Elle répondit au gouverneur en le priant de charger Louis Livingston, neveu du général, de présider à la translation des restes.

Celui-ci a tenu un journal de ce funèbre voyage; il est adressé à son père, Edward Livingston, qui, à cet époque, était en Louisiane. Il est très détaillé et inconnu du public.

La grande crainte des délégués était de ne pouvoir — après tant d'années écoulées — être conduits à l'endroit exact où le général Montgomery avait été inhumé. La tombe étant trouvée et reconnue, que pouvait-il bien rester du cadavre? Voilà la question que chacun se posait.

En arrivant à Québec, le colonel Livingston fut présenté à un vieillard de quatre-vingt neuf ans. Il avait servi dans l'armée anglaise, et c'était celui-là même qui avait reçu l'ordre de faire enterrer Montgomery. Sa mémoire était excellente. Livingston et M. Thompson — c'était le nom de l'ancien militaire anglais — allèrent visiter l'endroit où avait eu lieu la sépulture. Le terrain avait un peu changé d'aspect, et M. Thompson hésita un moment; enfin il indiqua ce qu'il croyait être l'endroit cherché, et à quelques pieds de là on trouva un cercueil. M. Thompson l'avait si bien décrit d'avance qu'il n'y avait pas à hésiter. Cette tombe était parfaitement conservée, bien qu'elle fut là depuis près de quarante-trois ans. La pression de la terre en avait défoncé le couvercle. Le squelette du général était presque entier. La tête était bien conservée, ainsi que les fémurs et les hanches; les côtes, les vertèbres, étaient entièrement disparues.

On ne toucha au cercueil primitif que pour le déposer avec beaucoup de précautions dans une caisse en bois dur.

Sir John Sherbrooke gouvernait alors la province de Québec. Au moment de la mission du colonel Livingston, il était dangereusement malade. Il lui fit écrire, néanmoins, une lettre fort délicate, dans laquelle il exprimait tout son regret de ne pouvoir recevoir comme il le méritait le parent d'un mort aussi illustre.

Sir John donna ensuite l'ordre de remettre privément à la mission de New-York les restes du général Montgomery.

A Whitehall, un escadron de cavalerie placé sous les ordres du colonel Van Rensselaer attendait le cortège funèbre. Le gouverneur Clinton avait donné l'ordre à cet officier supérieur et à l'adjudant-général de prendre commandement de cette escorte qui devait servir de garde d'honneur jusqu'à New-York.

L'arrivée des restes mortels de Montgomery, à Albany, était fixée pour le 4 juillet, jour de la fête de l'Indépendance. Toute la ville était sur pied pour honorer dignement la mémoire du héros. La milice formait une haie qui se prolongeait à un mille en dehors d'Albany. Les porteurs des coins du poele étaient tous d'anciens officiers de la guerre de la Révolution. Les restes mortels de Montgomery furent placés en chapelle ardente au Capitole. De semblables honneurs — ils n'étaient pas aussi magnifiques peut-être, mais ils étaient tout aussi spontanés — avaient été rendus à Montgomery par les villes et par les villages tout le long de la route suivie par le convoi.

Le 6 juillet, à 9 heures du matin, l'ordre fut donné de transborder le cercueil sur le bateau à vapeur, le *Richmond*. Le colonel Livingston, ses deux aides de camp et une forte escorte militaire reçurent la consigne de conduire le funèbre cortège jusqu'à New-York, et là de se mettre aux ordres de la Société de Cincinnatus, à l'hôtel-de-ville.

Le passage du *Richmond* était salué sur chaque rive de l'Hudson par le canon.

Le gouverneur Clinton avait prévenu Mme Montgomery que tout ce qui restait sur terre de celui qu'elle avait tant aimé, passerait à telle heure devant *Montgomery Place*, près de Barrytown.

Laissons la parole à cette veuve inconsolable. Elle écrit à sa mère cette scène d'une façon fort touchante :

" Enfin, le voilà ! Il vient ; il passe ! Voilà donc tout ce qui me reste maintenant de celui qui m'a quittée dans la force de sa virilité pour aller s'immoler à ce qu'il aimait encore plus que moi, son pays ! Il est près de moi enfin ! Mon cœur se gonfle ; il bat d'angoisse, et pourtant cette angoisse qui me fait mal n'est pas une douleur. Je ne saurais vous décrire tout ce que j'ai ressenti quand son cercueil a passé devant ma maison, ou plutôt devant *sa* maison. Le bateau à vapeur allait à demi-vitesse : tout à coup il s'arrête devant moi ; les troupes présentent les armes, les tambours battent au champ ; voilà ce que j'ai pu non pas voir, mais percevoir, car mon cœur éclata, et je ne me rappelle plus rien."

Voici ce qui s'était passé à ce moment suprême. Sur ses vives instances, Mme Montgomery fut laissée seule sur la vérandah, au moment de l'arrêt du *Richmond*.

Quarante-trois ans s'étaient écoulés depuis que son mari l'avait quittée, à ce même endroit, pour aller à Saratoga, et de là entreprendre la campagne du Canada ! Que se

passa-t-il ? Nul ne le sait. Quand le *Richmond* reprit sa route, on trouva Mme Montgomery évanouie, et on eut beaucoup de peine à la faire revenir à elle.

Le lendemain, elle écrivait à son frère, qui était à la Nouvelle-Orléans :

" J'ai beaucoup pleuré hier, mais je suis contente. Que pouvais-je désirer de plus grand, de plus honorable que l'ovation faite par l'Etat à tout ce qui reste de mon pauvre et brave soldat."

A New-York on fit les choses grandement. Toute la ville était en deuil. Les troupes étaient sous les armes ; le canon de l'arsenal de marine, de la batterie et des forts tonnait de minute en minute ; les cloches tintaient les glas ; les drapeaux étaient en berne. Les cendres de Montgomery furent déposées, le 8 juillet 1818, sous le monument qui a été érigé à sa mémoire dans l'église de Saint-Paul.

Ce chef-d'œuvre avait été sculpté en France, d'après les ordres de Benjamin Franklin. Ce grand homme en avait composé l'inscription : elle se lit ainsi :

— *Ce monument a été élevé par ordre du Congrès, le* 25 *janvier* 1776, *afin de redire à la postérité le souvenir reconnaissant que la patrie américaine conserve de la conduite patriotique, de l'esprit d'entreprise et de la persévérance du major-général Richard Montgomery. Après une série de succès remportés au milieu des obstacles les plus décourageants, il fut tué sous les murs de Québec, pendant l'attaque faite par lui contre cette ville, le* 31 *décembre* 1775. *Il était âgé de trente-sept ans.*

Les seuls souvenirs personnels qui restent aujourd'hui de Montgomery sont les quelques lettres que vous venez de lire, sa correspondance avec le général Schuyler, qui est aux archives de Washington, sa montre et son cachet encore aujourd'hui dans la famille, et son sabre qui est déposé au musée de la Virginie. Lady Ranelagh envoya, quelque temps après la mort du général, un excellent portrait de lui, à Mme Montgomery. Il représente le général à l'âge de vingt-cinq ans. Il a une belle tête qu'il porte fière et haute, une physionomie franche, décidée, l'œil un peu rêveur, l'allure martiale et distinguée.

En songeant à l'exhubérance de vie, de force, de jeunesse que présente ce portrait de Montgomery, et en rapprochant toutes ces belles choses de la description que le colonel Livingston nous donne de l'état où il retrouva les restes du général, on ne peut s'empêcher de répéter les dernières paroles qu'il disait à sa femme en la quittant pour aller combattre et mourir :

— *Tis a mad world my masters. I once thought so : now I know it.*

— Nous traversons un monde méchant, mes maîtres. Jadis, je m'en doutais : aujourd'hui je le sais.

II — *A la conquête de la liberté en France et au Canada,*

Par A.-D. DE CELLES, L.D.

(Lu le 27 mai 1891.)

Il y a cent ans, la France, sur la pente de la révolution, brisait avec les traditions de la monarchie absolue, édifiée par Richelieu et Louis XIV, pour se donner des institutions nouvelles, conformes aux idées de liberté propagées par l'école philosophique. " *Qu'est-ce que le tiers état ? Rien. Que doit-il être ? Tout*, disait un pamphlétaire célèbre. Ce nouvel aphorisme, lancé comme un défi à l'*État, c'est moi*, comportait, dans sa formule concise, tout un programme de rénovation sociale et politique que la France s'est efforcée de faire passer dans le domaine de la réalité, durant tout un siècle dont elle célébrait en 1889 le terme, au milieu des fêtes de sa merveilleuse Exposition universelle.

A la même époque, un rejeton de la vieille France, violemment arraché aux bras de sa mère, laissé naguère à demi-mort sur la terre du Canada, rougie de son sang, relevait la tête et se croyait assez fort pour partir lui aussi à la conquête des droits de l'homme, sans en formuler cependant une pompeuse déclaration. Mais combien plus difficile était l'entreprise du fils ! La France, en pleine possession de ses destinées, ne voyait d'autres obstacles à ses espérances de société idéale, de gouvernement du peuple par le peuple, que ceux qu'elle pouvait susciter. Animés des intentions les plus libérales, les états généraux préparent le retour de l'âge d'or : les trois ordres qui les composent rivalisent de zèle ; la noblesse sacrifie ses privilèges, le clergé bénit les travaux du peuple au bruit des acclamations générales ; tous s'exaltent à la pensée que la France, n'ayant rien à envier à l'Angleterre et à l'Amérique, va donner au monde le modèle d'un gouvernement démocratique où règneront la justice égale pour tous, le bonheur largement distribué à chacun, sous la direction infaillible du peuple souverain. Rechercher comment la France, au lendemain de débuts si pleins de promesses décevantes, s'est engagée dans l'engrenage d'évolutions politiques, les unes cherchant à s'établir sur le terrain mouvant des décombres laissés par les autres, sans pouvoir se flatter d'être sortie à l'heure présente de cet état chaotique ; rechercher pareillement comment une poignée de Français-canadiens sont arrivés, pendant le même intervalle, à la jouissance complète des libertés politiques à travers les vicissitudes de maintes batailles, sans autres armes que celles qu'ils ont arrachées à leurs vainqueurs, tel est le but de l'étude qui va suivre.

I

Il y aurait peut-être lieu de se demander au début si la race française possède les qualités nécessaires au *self-government ?* Lord Salisbury ne réclamait-il pas dernièrement l'exercice du *self-government* comme l'apanage exclusif et naturel des peuples d'origine

teutonique ? C'est l'opinion reçue dans les Trois-Royaumes sans examen, car la vanité nationale y trouve son compte. C'est une exagération qui arrachait ce cri de protestation à la *Westminster Review*[1]. "Il y a une bonne dose d'ignorance et de suffisance insulaires dans l'idée admise en Angleterre que l'art de gouverner commence et finit sur nos bords." Prenons note de l'aveu de la revue ; son avis était aussi le nôtre, mais jamais nous n'aurions osé l'exprimer, tellement cette idée exclusive est ancrée solidement dans la plupart des esprits. Il y a un trait admirable du caractère des Anglais : c'est que, convaincus de leur supériorité en tout sur les autres nations, ils ne médisent jamais de leurs institutions, et finissent par imposer leur conviction aux autres, tandis que chez les Français la manie de se diffamer existe à un degré alarmant. Certes, lorsqu'il arrive aux Anglais de comparer leurs institutions à celles de leurs voisins, ils ont cent fois raison d'en être fiers, car elles leur ont valu des siècles de gloire, des relations commerciales incomparables et la création d'un empire le plus vaste, le plus riche que le monde ait vu. Mais conclure de ces succès que leur civilisation est supérieure à celle des autres peuples, c'est tomber dans une exagération palpable. Du reste, est-il bien établi que le gouvernement anglais soit le meilleur ? Sans doute, il s'est montré un merveilleux instrument entre les mains de l'oligarchie, mais soutiendra-t-il l'épreuve du suffrage universel vers lequel il s'incline fatalement ? Est-il assez souple pour répondre aux besoins des sociétés modernes ? Rien n'est moins établi. Il n'y a pas longtemps, lord Grey notait sa grande faiblesse en présence de la démocratie qui paralyse son action, et des observateurs sérieux font pressentir qu'à moins de modifications, le mécanisme du Parlement de Westminster s'enrayera de lui-même. Pourquoi emboucher le clairon pour proclamer la supériorité d'un système sur un autre ? Le meilleur gouvernement n'est-il pas celui qui s'adapte le mieux aux besoins, aux mœurs et aux traditions de chaque peuple ? Comme le dit le poète : —

For forms of government let fools contest
Whate'er is best administered, is best.

Il ne faut pas perdre de vue le fait que la civilisation française donnait le ton à l'Europe lorsque les barons français arrachèrent au roi Jean Sans-Terre la grande charte des libertés anglaises. La France du moyen âge remplit le monde du bruit de ses hauts faits. C'est à sa suite que la chrétienté marche à la délivrance de Jérusalem, en répétant : *Dieu le veut !* ce cri poussé d'abord par une poitrine française. En Orient, son nom éclipse, absorbe tous les autres, et jusqu'à nos jours, les nations du Levant désignent par le nom de Francs tous les peuples de l'Europe. Grégoire IX compare la fille aînée de l'Eglise à la tribu de Juda, qui surpassait toutes les autres en piété et en valeur. Son prestige rayonne au loin, au milieu des montagnes de l'Ecosse comme sur les confins du désert. L'Allemagne, l'Angleterre et l'Italie s'inspirent de sa littérature, imitent sa chevalerie, reproduisent ses chefs-d'œuvre d'architecture ; et encore aujourd'hui l'artiste qui étudie en remontant aux sources, trouve visibles et frappants les vestiges de l'art français dans les cathédrales de Cologne et de Westminster. C'est à Paris que la jeunesse des familles nobles accourt pour puiser la science dans sa célèbre université, à tel point qu'un poète de l'Angleterre a pu écrire à cette époque : —

Filii nobilium, dum sunt juniores,
Mituntur in Franciam, fieri doctores.

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[1] Livraison du 1er avril 1887.

Cette empreinte française, nous la retrouvons sur les feuillets de la *Magna Charta*, dont les Anglais sont si fiers à bon droit. Ne porte-t-elle pas surtout les signatures des barons normands, et n'a-t-elle pas été rédigée, en toute probabilité, dans la vieille langue de nos pères ?

Le développement progressif du système anglais ne s'est pas accompli d'après un plan habilement combiné, sorti de la tête de quelques hommes de génie. Il est bien plutôt la résultante d'idées générales qui avaient cours aussi bien en France qu'en Angleterre. Il s'en est peu fallu que nos pères aient eu des institutions politiques semblables à celles de la Grande-Bretagne. Ainsi, aux états généraux de 1355, on vit le tiers état réclamer par résolution des privilèges auxquels un édit royal donna momentanément force de loi. On aperçoit dans ses termes les bases mêmes de la constitution anglaise : le droit de répartir l'impôt sur toutes les classes, impôt fixé par les états généraux ; le principe du partage de l'autorité entre le roi et les trois ordres de la nation. Voici ce curieux texte de l'ordonnance du 28 décembre 1355 :

(2) *Item.* "Est ordonné que des trois estats dessusdiz, seront ordonnez et depputez certaines personnes, bonnes et honnestes, solvables et loyauls, et souz aucun souspeçon, qui par les pays ordonneront les choses dessusdites, qui auront receveurs et ministres, selon l'ordonnance et instruction qui sera faite sur ce ; et oultre les commissaires ou depputez particuliers des pays et des contrées, seront ordonnez et establiz par les trois estats dessusditz neuf personnes bonnes et honnestes, c'est assavoir de chascun estat trois, qui seront generaulx et superintendens sur touz les autres, et qui auront deux receveurs generaux prudhommes et bien solvables, pour ce que lesdiz superintendens ne seront chargiez d'aucune recepte, ne de faire compte aucun." (Ordonnance du 28 déc. 1355.)

" La France fut quelque temps gouvernée comme l'Angleterre, dit un auteur, en commentant cette fameuse ordonnance. Les rois convoquaient les états généraux substitués aux anciens parlements de la nation. Les états généraux étaient entièrement semblables aux parlements anglais, composés des nobles, des évêques et des députés des villes ; et ce qu'on appelait le nouveau parlement sédentaire à Paris était à peu près ce que la cour du banc du Roi était à Londres. Le chancelier était le second officier de la couronne dans les deux états ; il portait en Angleterre la parole pour le roi dans les états généraux d'Angleterre, et avait inspection sur la cour du banc ; il en était de même en France ; et ce qui achève de montrer qu'on se conduisait alors à Paris et à Londres sur les mêmes principes, c'est que les états généraux de 1355 proposèrent et firent signer au roi de France presque les mêmes règlements, presque la même Charte qu'avait signée Jean d'Angleterre. Les subsides, la nature des subsides, leur durée, le prix des espèces, tout fut réglé par l'assemblée. Le roi s'engagea à ne plus forcer les sujets de fournir des vivres à sa maison, à ne se servir de leurs voitures et de leurs lits qu'en payant, à ne jamais changer la monnaie, etc."

" Ces états généraux de 1355, les plus mémorables qu'on ait jamais tenus, sont ceux dont nos histoires parlent le moins. Daniel dit seulement qu'ils furent tenus dans la salle

[1] Nous avons fait de longues recherches pour trouver le texte original de la grande charte. Les plus anciens recueils la donnent en latin et en français. Nous inclinions à croire qu'elle avait été rédigée en cette dernière langue, lorsque ce passage de M. Kingston Oliphant, M.A., d'Oxford, vint confirmer notre opinion : " *The Great Charter* is said to have been put forth in French, not in Latin." Earle, l'auteur de *Philology*, est du même avis.

du nouveau parlement ; il devait ajouter que le parlement, qui n'était point alors perpétuel, n'eut point entrée dans cette grande assemblée. En effet, le prévôt des marchands de Paris, comme député né de la première ville du royaume, porta la parole au nom du tiers état. Mais un point essentiel de l'histoire, qu'on a passé sous silence, c'est que les états imposèrent un subside d'environ 190,000 marcs d'argent, pour payer 30,000 gendarmes ; ce sont 10,400,000 livres d'aujourd'hui. Ces 30,000 gendarmes composaient au moins une armée de 80,000 hommes, à laquelle on devait joindre les communes du royaume ; et au bout de l'année on devait établir encore un nouveau subside pour l'entretien de la même armée. Enfin, ce qu'il faut observer, c'est que cette espèce de grande charte ne fut qu'un règlement passager, au lieu que celle des Anglais fut une loi perpétuelle. Cela prouve que le caractère des Anglais est plus constant et plus ferme que celui des Français."

Comment la France, après s'être si bien engagée dans la voie du gouvernement représentatif, en a-t-elle dévié pour aboutir à la monarchie absolue ? Bien des causes ont concouru à fortifier le pouvoir des rois aux dépens des libertés populaires. Tandis qu'en Angleterre, la noblesse, appuyée sur le peuple, s'efforçait de circonscrire dans des limites étroites l'influence de la couronne, il se passait une lutte tout autre en France. Le roi luttait contre ses grands vassaux, souvent aussi puissants que lui, et appelait à son secours les communes affranchies qui avaient à se plaindre des seigneurs. Le roi se servit du peuple pour abattre la noblesse, qui trouva son maître dans la personne de Louis XI et celle de Richelieu ; elle était toute prête pour la servitude de Versailles, lorsque Louis XIV signifia au parlement de Paris qu'il entendait régner et gouverner seul. La royauté avait donc joué le peuple contre la noblesse, et fini par confisquer le pouvoir des uns et des autres à son profit. Les états généraux, l'institution de l'ancienne France la plus ressemblante au parlement anglais, ne furent pas convoqués pendant toute la durée des règnes de Louis XIII (après 1614), Louis XIV et Louis XV. On ne les revit qu'en 1788, à la veille de la Révolution.

Les guerres de religion du XVIe siècle favorisèrent énormément la concentration du pouvoir entre les mains du roi. A cette époque, les querelles religieuses dominent tout le monde, passionnent toute la société. C'est la préoccupation générale. En pays hérétique les catholiques sont des rebelles et le bûcher en débarrasse l'Etat. Les protestants ne sont pas plus tolérés en pays catholique. C'est le règne de la persécution mutuelle. Il est admis en principe, à droite comme à gauche, que la foi étant le plus précieux des biens, il faut la protéger plus que tout au monde. De même que de nos jours la question sociale est au premier plan, de même au XVIe siècle, la question religieuse absorbe tous les esprits, que ne préoccupent nullement les libertés politiques et les principes de gouvernement. C'est alors que la royauté se transforme ; comme elle personnifie les aspirations religieuses et nationales, on se rallie autour du trône pour repousser l'étranger qui prête main-forte aux protestants. Le roi concentre tous les pouvoirs entre ses mains. Cette dictature, née d'une situation extraordinaire — un grand danger national à conjurer — et destinée à disparaître avec celui-ci, devint la royauté absolue. Sous Louis XIII, Richelieu porte le dernier coup aux protestants et à la noblesse ; Louis XIV formule les maximes du droit divin ou du gouvernement personnel : *Si veut le Roi, si veut la loi.* Ainsi se fonde la monarchie absolue qui s'effondrera sous Louis XVI. Pendant cent trente ans, la vie politique est éteinte ; trente millions d'âmes n'ont d'autre âme politique que celle du roi, dont l'autorité n'est limitée que par son bon plaisir. Mais voici venir les philosophes de la seconde

moitié du XVIIIe siècle. Ils sèment des idées nouvelles ; Montesquieu représente en traits fortement colorés les avantages du système anglais. Rousseau idéalise le gouvernement démocratique ; Voltaire sape à sa façon les bases de la monarchie, tandis que Beaumarchais raille sans pitié, aux applaudissements d'une cour frivole, la noblesse et les abus du pouvoir absolu. Les grands mots de liberté, d'indépendance, de justice égale pour tous, résonnent agréablement à l'oreille du peuple, et lorsqu'au milieu d'une situation pleine d'anxiété, aggravée par la misère publique, les états généraux sont convoqués, l'opinion est mûre pour la Révolution. Pendant de longues années, la compression de toute l'énergie nationale avait été si forte que l'on devait s'attendre à une violente réaction. Les anciennes institutions françaises disparurent. Au lieu de les réformer, la Révolution fit table rase du passé pour édifier de toutes pièces un ordre de choses nouveau. Entreprise gigantesque qui n'est pas encore terminée, après un siècle de tâtonnements. C'était à prévoir. L'expérience n'est-elle pas là pour prouver que les constitutions politiques s'élaborent péniblement avec le temps, que les différentes pièces de ces sortes de mécanisme viennent comme d'elles-mêmes s'adapter les unes aux autres ; jamais le monde n'a vu de constitutions viables sortir d'un jet des mains de l'homme, sauf celle des Etats-Unis, qui n'est au fond que la constitution de l'Angleterre appropriée aux besoins d'une démocratie ; elles sont comme l'œuvre inconsciente du temps et de l'expérience.

Etait-il probable que, sans transition, le caractère français, plié durant des siècles aux exigences du régime monarchique entrerait du jour au lendemain dans le jeu des institutions parlementaires ? On demandait un jour à Palmerston, qui blâmait les Français d'avoir renversé le gouvernement de Louis-Philippe, ce que ses compatriotes auraient fait à leur place. "Nous l'aurions conservé, mais nous l'aurions réformé, répondit-il." L'erreur capitale des hommes de la Révolution et de leurs successeurs a été de trouver détestable dans son entier l'œuvre des régimes précédents.

La Révolution française a justifié à la lettre cette pensée de Montaigne : "Toutes grandes mutations esbranlent l'Estat et le désordonnent." Lorsque les quelques hommes de 1789 qui avaient des notions de gouvernement se furent effacés pour laisser la carrière libre aux aventuriers, aux ambitieux, la France roula jusqu'au fond de l'abîme de l'anarchie. L'absolutisme du roi, qui n'était pas sans grandeur, fit place à la plus effroyable tyrannie que le monde ait vue, concentrant toute l'autorité en elle-même et absorbant jusqu'au pouvoir judiciaire. On détourne les yeux du spectacle de la Terreur, des turpitudes du Directoire, pour les porter à la frontière, où les soldats de la République se couvrent de gloire. Cependant les débuts de la Révolution avaient permis d'espérer qu'il sortirait des états généraux des réformes qui reconcilieraient le principe monarchique avec les idées modernes. L'Assemblée nationale, qui avait succédé aux états généraux, commit une erreur immense en décidant qu'aucun de ses membres ne serait éligible à l'assemblée qui devait la remplacer. C'était décréter que les hommes d'expérience, les initiateurs de la réforme, céderaient la place aux empiristes, à ces gens qui sortent de sous terre aux époques troublées, et qui, n'ayant rien, aspirent à avoir tout. Il n'y a pas à étudier la Terreur au point de vue des progrès de la liberté et de la formation des mœurs politiques. Elle servit à dégoûter la France des idées nouvelles pour la pousser vers le despotisme de Bonaparte, qui, au moins, lui donna l'ordre et la gloire.

L'histoire s'est montrée bien injuste pour la Restauration ; ce n'était pas une petite entreprise que celle de gouverner la France, épuisée par les guerres de la Révolution et de

l'Empire, appauvrie, humiliée, et partant plus accessible au mécontentement. Louis XVIII l'a tentée avec loyauté et souscrivit la charte de 1814, qui consacrait les réformes de 1789 et quelques institutions de l'Empire. En vertu de la constitution nouvelle, le roi, assisté de ministres responsables, est revêtu du pouvoir exécutif; il fait les ordonnances que réclament la sûreté de l'Etat et l'exécution des lois. La puissance législative s'exerce collectivement par le roi et les deux chambres: celle des pairs de création royale, et celle des députés élus par un suffrage très restreint, l'initiative appartenant au souverain. Les lois peuvent être soumises à l'une ou à l'autre chambre, excepté les mesures fiscales qui relèvent d'abord des députés. Il suffit de jeter un coup d'œil sur cette esquisse sommaire de la charte de 1814, pour constater qu'elle présentait dans ses grandes lignes une constitution bien avancée pour l'époque. On aurait dû s'en contenter, car elle contenait en germe l'ensemble de ce que l'on est convenu d'appeler les libertés modernes. Il n'en fut rien. A droite comme à gauche, on la battit en brèche. Il est malheureusement vrai que la foule se laisse prendre trop aux mots; que de dupes n'a-t-on pas entraînées vers l'abîme aux cris de: liberté, égalité! Les adversaires de la monarchie attaquaient la charte, parce qu'elle énonçait ce principe, que "*le roi faisait octroi et concession à ses sujets de la charte.*" Cela sentait trop l'ancien régime, et l'on perdait de vue que la France possédait la responsabilité ministérielle, cette panacée à tous les maux! On aurait voulu tenir de la souveraineté nationale ce bienfait et les autres que conférait la charte, s'attachant ainsi plus à la forme qu'au fond véritable de la constitution. C'est pourtant sur ce détail insignifiant que s'engage la bataille avec un acharnement sans pareil, la royauté ne sachant où trouver un appui, même auprès de ses amis, divisés en deux camps. La Restauration comptait cependant des hommes d'Etat de premier ordre, comme le duc de Richelieu, Decazes, de Serre, Villèle, Martignac et Chateaubriand. Louis XVIII avait la souplesse nécessaire pour s'orienter au milieu des obstacles; mais, avec son frère et successeur, les idées de pouvoir personnel reviennent en faveur, et les difficultés suscitées par les royalistes se multipliaient d'un jour à l'autre. Après avoir tenté de gouverner avec un ministère libéral, dirigé par M. de Martignac, il appelle au pouvoir, après le renversement de ce dernier, M. de Polignac, un réactionnaire. Avec son consentement, Charles X publie les fameuses ordonnances de juillet, qui restreignent la liberté de la presse et le cens électoral. Paris se soulève, le roi passe en Angleterre et le duc d'Orléans prend la place de son cousin. Un nouvel essai de monarchie constitutionnelle allait commencer. Louis-Philippe s'intitulait, non pas roi de France, mais roi des Français, ce qui impliquait l'intervention du peuple dans son élévation au trône. Son pouvoir ne découlait pas de l'hérédité, mais de l'élection.

Comme Louis XVIII et Charles X, le roi des Français règne en vertu de la charte de 1814, modifiée dans un sens libéral. La monarchie de Juillet constitue, à notre sens, la tentative la plus fructueuse de gouvernement à l'image de celui de l'Angleterre dont la France ait joui. La bourgeoisie put participer dans une large mesure à la direction des affaires, sous Thiers et Guizot, pendant que la chambre des pairs exerçait sa part légitime d'influence. Louis-Philippe comprenait aussi bien que ses ministres le jeu des institutions parlementaires, et répétait, après Thiers qui l'avait formulée, la fameuse maxime: *Le roi règne, mais ne gouverne pas.* Certes, il aurait définitivement fondé la monarchie constitutionnelle; mais son horreur des mesures rigoureuses l'empêchèrent de réprimer l'émeute, d'abord insignifiante, qui lui fit prendre la route de l'exil.

La République de 1848 n'est qu'une transition ; elle succombe sous l'étreinte brutale de Louis Bonaparte ; elle porte la responsabilité de sa devancière et le spectre de 93 lui est fatal, de même que l'éclat d'une grande renommée dérobe aux yeux de la France le césarisme qui s'intronise avec Napoléon III. Dix-huit ans de pouvoir personnel, de régime de compression à outrance, d'étouffement de toute vie nationale, lassent la France, qui revoit le retour de la république après le renversement de l'empire, le 4 septembre 1870. La nouvelle constitution marque un progrès vers des idées de gouvernement plus saines, mais elle n'apporte pas la stabilité du pouvoir ; la République dévore gouvernements et ministres d'une façon alarmante ; vingt-quatre administrations se succèdent en vingt ans. Il n'entre pas dans notre pensée de faire son procès au régime actuel, pour montrer que les vices des gouvernements précédents pèsent lourdement sur lui, et que sa conduite est, au fond, la négation des principes sur lesquels il prétend s'appuyer. En remontant la série des régimes successifs, on est forcé de constater que plus les constitutions changent en France, plus les procédés de gouvernement sont les mêmes. Depuis Richelieu, le despotisme s'est transformé, mais c'est toujours le despotisme exercé soit par un dictateur, soit par une assemblée : la Convention, c'est la tyrannie la plus révoltante ; le Consulat, l'Empire, c'est la dictature militaire, et la République de Gambetta, c'est encore la main de fer de l'absolutisme.

De combien de malédictions n'a-t-elle pas été l'objet, cette maxime du régime du bon plaisir : *Si veut le roi, si veut la loi!* Cependant, sous le flamboiement des grands mots, *Liberté, Egalité, Fraternité*, gravés au frontispice de tous les monuments publics, les maîtres du jour en France ne disent pas : l'Etat, c'est nous ! mais ils agissent comme s'ils en étaient convaincus. Qu'ils proclament à satiété les droits de l'homme, l'arbitraire qui caractérise leurs lois sur l'éducation, leurs rapports avec l'Eglise, leur façon cavalière de se débarrasser d'un adversaire : témoin l'expulsion des princes et celle de Boulanger, sont là pour attester que pour ces potentats d'un jour rien ne doit tenir devant l'Etat qu'ils personnifient. Et ces impitoyables railleurs de l'infaillibilité pontificale se conduisent — comme s'il n'était pas permis de douter de leur infaillibilité — en dehors de tout contrôle, excepté le contrôle illusoire d'une majorité à leur dévotion.

Ce sont les théories de Rousseau qui semblent dominer les hommes de 93 et leurs successeurs. Le *Contrat social* pose en principe " l'aliénation totale et sans réserve de chaque associé avec tous ses droits à la Communauté ". C'est appuyés sur ce principe étrange que ses disciples s'emparent des droits de tous, ainsi aliénés, pour en user à leur guise et décréter, comme la Convention le fit un jour, que la souveraineté nationale est une, indivisible, inaliénable et imprescriptible ; elle appartient à la communauté, et nul individu ne peut s'en attribuer l'exercice. Voilà la conception de l'Etat acceptée par la Révolution. Le pouvoir ne vient pas de Dieu, mais découle de la volonté populaire qui en investit ses mandataires. Ceux-ci sont constitués par là même en autorité absolue, et cette idée du pouvoir n'admet pas de contrôle, ni de limite, ni de rivalité : l'Etat prime tout, et son ingérence abusive se glisse, s'insinue dans toutes les artères du corps social. Il se substitue au père de famille et à la religion dans l'éducation de l'enfant. Comment après cela donner un corps à ce rêve caressé par les utopistes de reconcilier l'Eglise et la Révolution ? C'est demander de s'entendre à deux puissances qui parlent au nom de principes contradictoires, irréductibles. C'est mettre en présence le *Non possumus* de l'Eglise et l'omnipotence de l'Etat dérivant des principes du *Contrat social*.

C'est à l'épreuve de l'expérience que l'on voit combien sont fausses les théories de Rousseau. Et dire que le célèbre évangile de la Révolution compte encore en France des admirateurs qui ont dû l'étudier à la lueur des incendies allumés par ses dangereuses utopies ! Combien plus pratiques les Américains ne se sont-ils pas montrés dans l'organisation de leur république ! Lorsque l'on compare l'œuvre de Washington, de Franklin et de Hamilton à celle des disciples de Rousseau, on saisit bien vite la différence qui sépare l'utopie du sens judicieux et pratique. Rousseau, grand politique en chambre, attend tout de l'homme, né bon ; les Américains ne se font pas d'illusions sur la faiblesse humaine et comprennent la nécessité de la défendre contre ses emportements, surtout dans un Etat démocratique, où elle subit tant d'influences dangereuses. S'ils constituent un pouvoir, ils lui assignent des limites précises. Aussi, dans leur œuvre, les sauvegardes, les contrepoids se rencontrent à chaque pas. Chez eux, point de puissance sans contrôle, et d'omnipotence nulle part ; à tous les tournants de la route, des barrières pour tenir la masse en échec. Ici, c'est le Président, qui possède plus de pouvoir que la reine d'Angleterre et s'en sert parfois rigoureusement ; M. Cleveland n'a-t-il pas opposé son véto à plusieurs centaines de projets de lois pendant son administration ? là, c'est la constitution fédérale, qui ne peut être modifiée sans le consentement des deux tiers des législatures de tous les Etats. Et la cour suprême n'est-elle pas placée au-dessus de toute la législation pour arrêter tout empiètement contraire à la charte du pays. Le sénat constitue par sa composition conservatrice une puissance modératrice en regard de la chambre des représentants. Plus nous étudions l'œuvre des pères de la République américaine, plus nous sommes étonnés de sa perfection, et nous n'hésitons pas à la regarder comme la constitution la plus parfaite sortie d'une conception humaine. Si elle ne répond pas aujourd'hui aux plans de ses auteurs, c'est que la perversité humaine s'est montrée plus ingénieuse que le génie de Washington et de Hamilton.

II

Ce furent des heures bien sombres et bien douloureuses que celles qui suivirent la capitulation de Montréal, le 8 septembre 1760. A la suite du drapeau blanc qui repassait les mers, emportant dans ses plis les regrets de ceux qu'il avait abrités dans ses jours de gloire, l'administration civile, les généraux, les hommes les plus considérables de la colonie rentraient en France. Il ne restait, sur la terre rougie par huit années de guerre, que les colons ruinés, attachés à ce sol du Canada, conquis à la civilisation au prix de luttes contre la barbarie, souvent vaincue, mais jamais anéantie. Aux souffrances physiques s'ajoutaient les tortures morales de la séparation violente qui venait de s'opérer, et les angoisses que faisaient naître les incertitudes de l'avenir. L'espérance serait sortie du cœur des malheureux Canadiens, s'ils n'avaient pas été élevés à cette dure école de l'adversité, qui écrase les faibles mais fortifie les forts. Aussi bien fallait-il avoir l'âme fortement trempée pour envisager sans fléchir la perspective qui s'offrait à leurs yeux. D'un côté, les colonies anglaises, leurs ennemis séculaires ; de l'autre, une nuée d'aventuriers venus de Boston, de New-York et de Londres, pour avoir leur part de la curée. Au-dessus, à la place de leurs anciens chefs, l'épée d'un vainqueur qui avait appris à les respecter sur les champs de batailles, mais à qui devaient répugner les institutions et les croyances des nouveaux sujets du roi. Que faire dans une situation aussi embarrassée ? Les Canadiens agirent

sagement en se repliant sur eux-mêmes pour opposer la force d'inertie aux entreprises que leurs maîtres pourraient tenter contre eux. On les vit s'isoler des Anglais, se grouper autour de leurs curés, seul vestige d'autorité survivante de l'ancien régime, pour former de petits centres où se conservait dans la ferveur, à l'ombre du sanctuaire, l'âme de la patrie, formée de l'attachement à la religion et aux traditions de leurs pères. Ce double sentiment, si intense à toutes les époques troublées de notre histoire, sera la colonne de feu qui les guidera vers leur destinée.

C'est une période de luttes terribles qui s'ouvre et qui va durer cinquante ans, pour décider du sort d'une poignée de colons aspirant à devenir une nation, luttes plus difficiles pour eux que celles du champ de bataille, car s'ils connaissaient leur métier de soldat, les armes de la politique leur étaient bien étrangères. Cette période se divise en quatre parties; de 1760 à 64, régime militaire, et de là à 1774, premier gouvernement civil, qui diffère peu du précédent, car l'absolutisme du gouverneur et du conseil règne partout. Ce n'est qu'en 1774, que les nuages noirs laissent passer une petite lueur d'espérance. L'Acte de Québec (1774) brise le premier anneau de la chaîne si fortement serrée à la conquête. Enfin l'Acte de 1791, qui subsiste jusqu'en 1838, nous ouvre les portes de la liberté politique dans une large mesure, autant que le comportent l'état du pays et les progrès faits par les Canadiens sur le terrain de la politique.

Esquissons à grands traits le tableau de l'état du pays de 1760 à 1774.

Les Canadiens, au nombre d'environ 70,000, éparpillés sur les rives du Saint-Laurent et du Richelieu, entraient dans le nouvel ordre de choses dépouillés de tous droits, hormis celui de pratiquer leur religion. C'est tout ce que nous garantissait le traité de Paris. Pour bien préciser notre position au point de départ, disons que nous avions à conquérir notre participation aux affaires publiques, l'usage officiel de notre langue et des lois françaises. Il entrait évidemment dans le plan de l'Angleterre de nous angliciser au plus tôt; c'était une politique que lui dictait la raison d'Etat. Pouvait-elle oublier les embarras que lui causait l'Irlande catholique ? L'entreprise devait d'autant plus lui sourire qu'elle semblait plus facile. Quelle résistance pouvait-elle attendre des Canadiens isolés de la France, placés à côté des colonies anglaises, plus antipapistes et antifrançaises que leur métropole ? Mais, étrange retour des choses d'ici-bas, ce sont ces dernières qui aideront tantôt, bien involontairement, à frustrer les desseins de l'Angleterre. Rendons justice aux quelques amis puissants qui dès lors couvraient nos ancêtres de leur protection. Le regard de l'historien s'arrête avec un sentiment de reconnaissance sur les nobles figures de deux militaires : Murray et Carleton, gouverneurs du Canada à cette triste époque. L'un et l'autre avaient appris à connaître et à apprécier les nouveaux sujets du roi, et pendant qu'autour d'eux les hommes sans aveu complotaient notre perte, eux plaidaient notre cause à Londres. Murray, qui était tenu par la proclamation de 1763 de convoquer une assemblée, fait échouer ce projet, dont l'injustice était trop flagrante; elle n'aurait été composée que de protestants, car la proclamation déclarait que ceux-là seuls qui auraient prêté le serment d'abjuration pourraient en faire partie. Rappelons-nous que c'est à cette époque que l'on voyait l'administration de la justice confiée au juge en chef Gregory, ex-pensionnaire d'une des prisons de Sa Majesté Georges III, et un grand jury à Québec décréter que la religion catholique était *a public nuisance*. Il n'est pas étonnant que Murray et Carleton aient senti leur âme de soldat se révolter en présence de telles avanies.

Mais voici que se produit au sein des colonies anglaises un mouvement inattendu.

Les descendants des Puritains, élevés dans un esprit d'indépendance singulier, impatients de toute contrainte, songent à se séparer de la mère patrie. Dotées dès leur origine d'assemblées législatives qui leur ont appris de bonne heure l'art de se gouverner, ces colonies veulent se servir de leur force pour priver du même coup la couronne anglaise de toutes ses possessions américaines, anciennes et nouvelles. La cour de Saint-James va bientôt comprendre qu'elles ne l'ont poussée à la conquête du Canada que pour leur bénéfice. Dans ce jeu des événements qui ont marqué la dernière partie du XVIIIe siècle, l'Angleterre et la France, qui va venir au secours des révoltés, semblent l'une et l'autre inconsciente du rôle qu'elles jouent ; seuls les colons américains, avec une foi et une habileté *puniques*, savent où ils vont ; ils donnaient dès lors un exemple de cette finesse de plus ou moins bon aloi qui a marqué depuis toutes leurs relations internationales.

Le cours des événements force donc l'Angleterre à modifier sa politique, ou du moins à ajourner son plan d'unification. Carleton (1774) demande au bureau colonial de rendre les lois françaises aux Canadiens et d'apporter quelque tempérament aux rigueurs administratives. C'est urgent, si la métropole veut se concilier le bon vouloir de ses nouveaux sujets, exposés aux tentations des insurgés américains qui, après avoir la veille réclamé contre eux des mesures répressives, leur font maintenant des offres d'amitié. La métropole écoute les sages avis de Carleton et diminue les vexations dont nos ancêtres étaient l'objet depuis la conquête.

L'Acte de Québec (1774), que nous valut l'intervention de Murray et de Carleton, nous rendait les lois françaises ; c'était l'unique concession, car le conseil législatif, qu'il continuait en lui donnant une majorité anglaise des deux tiers, lorsque la population totale du pays ne comptait qu'un Anglais sur cent cinquante habitants, nous était hostile. Les Canadiens surent cependant s'en servir habilement pour faire connaître leurs griefs au roi. S'ils ne pouvaient en obtenir justice, au moins le forçaient-ils, en présentant des amendements aux résolutions de l'exécutif, à consigner de façon à les rendre publiques leurs plaintes et doléances, car les procès-verbaux de ce corps étaient transmis à Londres. Il est à remarquer que, pendant les cinquante premières années du régime anglais, les gouverneurs, à quelques exceptions près, s'efforcent de nous retirer les concessions du bureau colonial. Haldimand, le successeur de Carleton (1776), n'y manqua pas. Sans son intolérable tyrannie, l'Acte de Québec aurait pris aux yeux des nouveaux sujets les proportions d'un immense acte de justice. La liberté de conscience, les lois françaises, l'usage de leur langue dans les documents officiels, que pouvaient désirer de plus les Canadiens habitués à l'arbitraire du régime français ? Ce sont les mesures vexatoires qui poussèrent dès lors les plus éclairés d'entre eux à réclamer une plus large participation au gouvernement du pays. Sans doute, ils devaient demander cette réforme tôt ou tard, car il est de l'essence de la nature humaine d'aspirer au progrès, à l'amélioration de sa condition, et ils ne pouvaient tarder à comprendre toutes les ressources que leur offrait la constitution anglaise pour combattre les projets de leurs ennemis. "Ils seront sujets du roi," avait répondu, lors de la capitulation de Montréal, Amherst à Vaudreuil, qui lui demandait de laisser aux vaincus les lois françaises. Les Canadiens veulent se prévaloir de cette parole qui comportait un sens comminatoire dans la bouche du général anglais. Si cette qualité leur rappelle les déchirements de la séparation, les humiliations de la conquête, elle leur promet comme compensation des privilèges précieux, et ils se promettent d'en profiter. Ils seront sujets anglais, non pas comme l'entendait Amherst, mais sujets anglais, maîtres

de leurs destinées, appelés à se gouverner eux-mêmes. Pour fortifier leurs réclamations, ils ne cessent de rappeler leur loyauté à la couronne anglaise. Que serait devenu Carleton, si les appels du congrès et de ses alliés les Français avaient trouvé de l'écho sur les rives du Saint-Laurent ? Haldimand et ses séides faisaient peu de cas de ces services, mais à Londres on sut reconnaître que si l'*union jack* flottait encore sur les murs de Québec, la Grande-Bretagne le devait à la vaillance, à la fidélité des vaincus des Plaines d'Abraham.

Pitt, Fox, Burke, tout ce que le parlement anglais comptait d'hommes à vues larges, comprirent qu'il fallait une politique de conciliation à l'égard des Canadiens pour sauver la situation et conserver cette colonie acquise au prix de tant d'années de luttes sanglantes. Fox faisait bien connaitre le mobile de la politique anglaise en cette occurrence, lorsqu'il disait : " Nous avons une colonie (le Canada) aspirant à la liberté et qui promet de prendre un grand développement ; il est essentiel que ses habitants ne voient rien ailleurs de nature à exciter leur envie. Le Canada sera conservé à la Grande-Bretagne par la volonté de ses habitants, et il ne pourrait l'être autrement. Ses habitants doivent sentir que leur position n'est pas moins bonne que celle de leurs voisins. Je désire que cette colonie n'ait rien à envier à aucun des domaines du roi." Que de vérités en quelques mots, et quel sens politique que celui de Fox ! Et la plupart de ces vérités ne sont-elles pas d'une application de tous les jours ici au Canada ? Ce n'est pas le seul enseignement que nous ont légué les hommes d'Etat anglais de cette époque. Vingt ans plus tôt, lorsque les premières pétitions des Canadiens arrivaient aux pieds du trône, lorsque les conseillers de George III songeaient à nous rendre nos lois, le procureur général Wedderburne écrivait dans un rapport au roi (6 décembre 1772) : " Est-il permis de dire — parce que le traité de Paris ne contenait qu'une promesse vague relativement à l'exercice de la religion catholique au Canada — est-il permis de dire qu'en vertu du droit de conquête, le vainqueur peut imposer aux nouveaux sujets les lois qu'il lui plait ? Cette proposition a été soutenue par quelques avocats qui n'ont pas su faire la distinction *entre la force et le droit*."

En présentant l'Acte de 1791 au parlement, Pitt exprimait l'espoir que cette mesure, qui nous donnait, avec le conseil législatif, une chambre d'assemblée, et qui partageait le Canada en deux provinces, mettrait fin aux divisions entre les Canadiens et les Anglais. Malheureusement il n'en devait pas être ainsi, car l'exécutif, aidé du conseil, où l'élément oligarchique était prépondérant, allait essayer, fidèle à ses traditions, de nous reprendre ce que l'Angleterre nous accordait. La lutte recommença dès les premiers jours, pour ne se terminer qu'en 1838, au milieu de la tourmente révolutionnaire. Le statut de 1791 constituait cependant un grand progrès, car il nous fournissait une arme puissante en nous accordant jusqu'à un certain point le contrôle des subsides.

Il est intéressant de suivre les premiers pas de nos ancêtres dans la voie, nouvelle pour eux, du gouvernement populaire. On s'attend à les voir trébucher au moindre obstacle, mais il n'en est rien. Leurs débuts feraient croire à de l'expérience chez eux ou à une intuition du régime parlementaire, tant ils s'avancent avec sûreté. Comme d'instinct, ils saisissent l'agencement des différents rouages de la machine. On dirait des parlementaires sortis de la chambre des Communes. Il y a quelque chose de touchant par sa simplicité dans l'attitude du premier orateur de la chambre, M. Panet, qui réclame le privilège de s'exprimer "dans la langue primitive de son pays natal, et prie le gouverneur d'accepter la traduction en anglais de ce qu'il aura l'honneur de lui dire ". C'est là son

premier vœu, comme pour bien marquer que les Canadiens tiennent avant tout à conserver la langue de leurs ancêtres. Ce n'est qu'en second lieu que la chambre demande par son agence, "les privilèges et libertés tels qu'ils sont usités dans les communes de la Grande-Bretagne, notre mère patrie ".

Un autre fait qui nous frappe, en jetant un coup d'œil sur les procès-verbaux de notre première chambre d'assemblée, c'est d'y voir figurer les noms d'un nombre fort considérable de députés anglais élus par des collèges français. Est-ce la reconnaissance de nos ancêtres qui se manifestait par ce trait de générosité ? Ou bien était-ce calcul de leur part, que de s'associer des hommes qui leur semblaient mieux préparés à faire fonctionner les nouvelles institutions ? Il est hors de doute que, quel que fût leur mobile, c'était une habile tactique, bien que ces députés ne se soient que rarement montrés touchés de ce procédé ; mais plus tard elle eut pour excellent résultat de leur créer d'utiles alliés. D'un autre côté, elle leur valut en Angleterre des amis influents, comme MM. Roebuck, Mackintosh et autres, qui plaidèrent leur cause dans le parlement anglais.

Deux hommes surtout dominent cette période de notre histoire, MM. Bédard et Papineau. Le premier, type de politique plein de réserve et de prudence, mais que rien n'arrête, ni la crainte de la prison, ni la peur de la mort, lorsque l'injustice a une fois déchaîné sa colère ; le second, porte un nom que son fils rendra le plus célèbre de notre histoire parlementaire, et il est le premier à défendre l'usage de la langue française au parlement. Lorsque M. Grant, appuyé par les autres députés anglais, propose que l'anglais soit la langue officielle, Papineau s'élève contre cette proposition, et la majorité, se rangeant à son avis, pose en principe que les deux langues auront les mêmes droits.

Lorsqu'il fut question de nous accorder la constitution de 1791, de toutes parts s'élevèrent, au Canada et à Londres, de formidables protestations. " Quoi, donner les institutions anglaises à ces descendants de Français ! jamais ils ne sauraient les comprendre." L'histoire a de cruelles ironies, car elle s'est évertuée à démontrer que, dans la grande lutte qui va s'engager de 1791 à 1838, entre le gouverneur, premier ministre de fait, ses conseillers et les députés anglais, d'une part, et les Franco-Canadiens, de l'autre, c'est toujours du côté de ces derniers que se trouvera la justice, et le véritable esprit du droit constitutionel. C'est en s'appuyant sur les précédents anglais, autorité incontestable pour le gouverneur, qu'ils demandent l'exclusion des juges du parlement, le contrôle de la dépense, la responsabilité à la chambre des fonctionnaires publics, une distribution plus équitable du patronage. Lorsque Craig, de sinistre mémoire, se jette à corps perdu dans la lutte, le *Canadien* lui met sous les yeux les passages de la déclaration des droits, lui parle des empiètements de Jacques II et de leurs conséquences. Il cite aussi De Lolme pour lui prouver qu'il viole l'esprit de la constitution et les traditions anglaises. Dès 1805, M. J.-F. Perrault publie un manuel de droit parlementaire ; quelques années plus tard, la chambre d'assemblée vote un crédit pour payer la traduction des quatre volumes anglais : "*Hatsell's Precedents*", plus connuspar les députés d'alors que par ceux de nos jours. La vie publique absorbe complètement les hommes en vue, les préoccupe comme une obsession. Un souffle de dévouement passe à travers leur existence, qui ne semble avoir de valeur que si elle est consacrée à la patrie. Chacun alors paie de sa personne ; la politique est un long enchainement de sacrifices ; les hommes de quelques moyens ouvrent leurs bourses aux plus pauvres ; c'est une lutte où se joue toute une existence nationale et tous comprennent

la grandeur et l'importance de la cause qu'ils soutiennent. C'était vraiment le parti des patriotes, et la glorieuse appellation qu'ils se donnaient n'était pas une usurpation!

Après quarante ans de combats, ils n'avaient encore rien gagné; toute leur énergie se brisait contre l'entêtement des gouverneurs, soutenus par une faction. C'est elle qui fit sortir une partie des Canadiens de l'agitation constitutionelle pour les précipiter dans la voie révolutionnaire. Le docteur O'Callaghan, député de Richelieu, et mort il y a quelques années bibliothécaire de l'Etat de New-York, accuse l'oligarchie d'avoir provoqué à dessein l'insurrection dans le but d'effrayer l'Angleterre et de l'amener à effectuer l'union des Provinces.

Il n'entre pas dans notre pensée de nous faire l'apologiste du mouvement insurrectionel de 1837, qui, malgré son retentissement, n'a été qu'une explosion bien partielle, car il n'a provoqué que trois engagements, peu considérables comme actions militaires, dans le district de Montréal. Sur qui doit-on en faire peser la responsabilité? Elle remonte principalement a quelques gouverneurs, et surtout à leur entourage, qui firent tout leur possible pour provoquer une levée de boucliers. M. Papineau s'est toujours défendu d'avoir voulu recourir aux armes. Dans les grands mouvements populaires, quand l'exaltation domine la foule, ce n'est plus la sagesse qui dirige, mais les plus exaltés qui prennent la tête du mouvement. Combien il aurait été plus sage de continuer l'agitation constitutionnelle en s'inspirant de l'exemple d'O'Connell! On n'aurait pas joué le jeu de ceux qui faisaient métier d'agents provocateurs de l'insurrection dans le but de nous perdre aux yeux de l'Angleterre. Combien il eût mieux valu accepter les concessions que nous offrait lord Goderich, ministre des colonies! Mais l'heure de la conciliation était malheureusement passée. Dans les époques critiques, toute l'habileté consiste à céder à point. Une concession faite à la dernière heure a l'air d'être arrachée au pouvoir, et on ne lui en sait aucun gré. L'insurrection eut pour résultat immédiat de hâter l'union des Provinces projetée depuis plusieurs années. En nous associant au Haut-Canada, dont la population augmentait plus rapidement que la nôtre, grâce à l'immigration, le ministère crut qu'il aurait enfin raison de nous: à brève échéance, l'élément français serait noyé dans les flots plus considérables de la population anglaise. L'union, c'était le châtiment de la révolte, c'était aussi la réalisation d'un rêve longtemps caressé, mais que l'on n'avait pas osé jusque-là mettre à exécution, tellement il répugnait à la colonie.

L'union plongea les Canadiens dans la consternation. C'était donc là le résultat de quarante années de luttes? De toutes parts s'élevaient des protestations qui prirent corps sous forme d'adresses. Qu'allions-nous devenir? Nos chefs vivaient sous le ciel de l'exil; leurs successeurs, sans expérience, se trouveraient, dans la nouvelle chambre, en face d'une majorité anglaise, hostile par nature et par intérêt. Nous étions donc condamnés à l'opposition perpétuelle, sans espoir de participation à la direction de la chose publique. Evidemment la situation était critique, et si la sagesse faisait défaut aux Canadiens, une seconde conquête du pays nous attendait sous une forme nouvelle. Quelle devait être leur attitude? Allaient-ils se cantonner dans une opposition déterminée à l'union pour en demander le rappel, ou bien se chercher des alliés dans le camp ennemi? Le rappel de l'union, c'était l'orientation que voulait donner à notre politique un certain nombre de patriotes intransigeants. Par bonheur, il se rencontra alors un homme, dont le sens pratique et la haute intelligence virent quel parti avantageux les Canadiens pourraient tirer de la responsabilité ministérielle, en manœuvrant habilement entre les deux partis "tory"

et "reformer" qui divisaient le camp anglais. Il lui paraissait évident qu'en ne soulevant pas de questions irritantes, qu'en laissant la députation anglaise libre de ses mouvements, celle-ci n'aurait pas assez de force de cohésion pour se concentrer en une faction entièrement hostile aux Canadiens. Les intérêts, les ambitions devaient avoir prise sur elle comme sur toute réunion d'hommes. Dans le chaos, Lafontaine vit de quel côté l'aurore de jours meilleurs pourrait poindre. Sous l'empire de son patriotisme, aussi ardent qu'éclairé, il entreprit, au milieu du découragement des uns et des critiques amères des autres, cette campagne politique qui peut soutenir la comparaison avec les plus célèbres manœuvres parlementaires d'O'Connell et de Parnell. La constitution nouvelle nous donnait la responsabilité ministérielle, et dès le début du nouvel ordre de choses, le gouverneur Sydenham s'ingénia à nous la refuser. Lafontaine pose alors les vrais principes du régime parlementaire avec une clarté, une force de raisonnement qui séduit les esprits positifs du Haut-Canada.

Il se réclame de l'école des grands parlementaires anglais. Sa parole convaincue trouve de l'écho chez les députés de la province voisine, et les partis se dessinent sous des traits nouveaux: là où l'on s'attendait à voir, d'un côté, des Français regrettant un ordre de choses qui ne pouvait plus revenir, et, de l'autre, des Anglais décidés à gouverner sans leur concours, apparaissent des libéraux des deux provinces combattant pour la responsabilité ministérielle contre les "tories", partisans arriérés des privilèges de la Couronne. Ce sera la grande gloire de Lafontaine d'avoir saisi le nœud de la situation et de s'être trouvé des alliés inattendus, pour vaincre avec leur aide Sydenham et Metcalfe, hommes éminents par leurs talents, mais trop imbus de préjugés qui les poussaient à marcher sur les traces des anciens gouverneurs.

Il eut l'immense mérite de comprendre que constituer un parti exclusivement français, c'était nous condamner à un isolement fatal.

Le mérite de Lafontaine est d'autant plus grand qu'il eut la force de caractère nécessaire pour se séparer de ses amis intraitables et braver leur critique. Ceux-ci ne comprenaient pas qu'il fût possible à un patriote d'être, sous le régime nouveau, autre chose qu'un adversaire intransigeant de l'Angleterre. L'arme à notre disposition sous le nom de responsabilité ministérielle avait une valeur qu'ils ne connaissaient point. Pour bien des Canadiens de cette époque, des plus respectables, Lafontaine n'était rien moins qu'un traître, une victime de l'or de la perfide Albion. Il vécut assez longtemps pour voir ses ennemis revenir de leurs préventions et la foule de ses compatriotes rendre hommage à son patriotisme éclairé. Avec Lafontaine s'était livrée la dernière grande bataille constitutionnelle, et la liberté nous arrivait dans toute sa plénitude.

Rendu à ce point de notre étude, il nous est possible de comparer la somme de liberté dont jouissent respectivement les Français de France et ceux du Canada. Disons, tout d'abord, que nous avons le *self-government* dans sa plénitude, à tous les degrés de notre organisation politique. De même que notre gouvernement fédéral et notre administration provinciale reflètent la volonté populaire dans sa plus large mesure, pour ce qui touche aux intérêts généraux du pays, de même le conseil de comté, corps autonome né de l'élection, se meut dans le cercle plus restreint des affaires locales. Mais ce n'est pas tout, la municipalité de paroisse, qui doit aussi son existence au suffrage populaire, placée à la base du système, actionne les premiers rouages de la machine. Conseils de comté, conseils de paroisse ne sont que des images rétrécies du gouvernement

central, plus paisibles, fonctionnant avec plus de simplicité et vivant aussi de la même inspiration.

Les libertés communales ne coulent pas à pleins bords en France comme chez nous. Partout l'autorité de Paris se fait sentir ; c'est du bureau du ministre de l'intérieur que part l'impulsion donnée au préfet, chef du département, qui la communique au maire de la dernière commune. C'est ainsi que se forme de tous les points extrêmes de la France une série d'anneaux qui viennent aboutir au centre. L'étincelle électrique lancée de Paris doit galvaniser ces corps inertes par eux-mêmes. Il n'y a pas encore bien longtemps, les maires étaient nommés par le ministre de l'Intérieur. On a décentralisé dans une faible mesure, mais qu'il y a loin de là à notre liberté municipale !

La différence dans la somme des libertés religieuses n'est pas moins considérable. Ici les évêques tiennent leur nomination du pape, mais sont virtuellement élus par leurs collègues de chaque province ecclésiastique. Là-bas le gouvernement désigne les candidats à l'épiscopat et le pape ratifie le choix. Il suffit d'indiquer ce dernier mode d'élection pour faire toucher du doigt les inconvénients du système. Les évêques eux-mêmes ne peuvent choisir les prêtres desservants que parmi les sujets agréés par le gouvernement. Les communautés religieuses ici ont la plus grande latitude ; le pouvoir civil reconnaît leur existence et leur permet d'acquérir des propriétés, tandis qu'en France elles sont pourchassées, persécutées, tolérées à peine ; dernièrement encore, la loi Brisson est venue aggraver leur situation, en les frappant d'une taxe intolérable. Notre système d'instruction publique repose sur les principes de la liberté de conscience la plus large. En France, le pouvoir civil garde la liberté pour ceux qui pensent comme lui, et froisse les sentiments religieux d'une grande majorité de Français. Le droit de réunion est absolu chez nous ; en France, il ne s'exerce qu'entouré de règlements de police. La presse canadienne ne connaît d'autres ennuis que ceux qu'elle se crée elle-même, en faisant dégénérer sa liberté en licence. Que nos journalistes trouveraient dures les citations de la 6e chambre qu'un gouvernement taquin peut leur susciter !

Français et Canadiens sont partis à la conquête de la liberté, à la même époque, mais leur marche n'a pas été parallèle. Il ne s'est rencontré sur la nôtre que trois étapes, que trois constitutions, toutes conçues dans le même esprit, inclinant vers le même horizon, les deux dernières accusant chacune un progrès sur celle qui l'avait précédée. Que de chemins de traverse la France n'a-t-elle pas pris ! que de retours sur ses pas ! que de contradictions dans les vingt constitutions qu'elle s'est données en cent ans ! Nos pères n'ont eu qu'un but en vue et n'ont suivi qu'une voie pour l'atteindre. L'habileté, la prudence ont marqué l'ensemble de leur conduite. Henry Taylor, secrétaire de lord Dalhousie, écrivant à un de ses amis en Angleterre vers 1827, déclarait que c'étaient les Canadiens qui formaient le véritable parti de gouvernement ; qu'eux seuls et quelques Anglais, leurs alliés, comprenaient le régime parlementaire. C'est dans l'histoire politique de l'Angleterre qu'ils cherchaient des armes et des leçons. Ils étaient là à bonne école. A tout prendre, et en tenant compte de l'imperfection des œuvres humaines, c'est encore l'Angleterre qui a donné au monde les meilleurs gouvernements ; c'est chez elle que doivent chercher des enseignements ceux qui veulent se donner des institutions populaires. Elle a eu l'avantage de voir se succéder aux affaires des générations d'hommes d'Etat qui ont compris que l'art de gouverner est inséparable des traditions, de l'esprit de suite, que le bon fonctionnement de la constitution anglaise repose sur les compromis, les concessions

mutuelles, la temporisation dans le règlement des questions épineuses ; les moyens violents et les coups d'Etat lui répugnent. Les constitutions entrent pour beaucoup dans le bonheur des peuples, mais il ne faut pas tout leur demander ; elles sont impuissantes sans les mœurs politiques. Quel merveilleux instrument que la constitution des Etats-Unis entre les mains des Américains ! Par contre, quelle arme dangereuse n'est-elle pas, transportée dans les républiques hispano-américaines, qui ont emprunté aux descendants de Washington leurs institutions mais non leurs mœurs politiques ! En entrant dans la voie nouvelle, la France avait deux modèles sous les yeux : un lui était fourni par la Grande-Bretagne, l'autre par les Etats-Unis. Imiter les institutions anglaises, avec son roi et sa noblesse, il ne fallait pas y songer, bien qu'elles eussent été vantées par Voltaire et Montesquieu ; ces deux philosophes n'exerçaient pas autant d'influence que Rousseau sur les hommes de la Révolution, qui faisaient leur évangile de ses dangereuses et impraticables rêveries. Restait la constitution américaine. Il n'aurait dû y avoir de ce côté aucune antipathie ; certes si les réformateurs se pâmaient d'admiration devant les Etats-Unis, ils ne les connaissaient guère et n'entendaient pas la liberté comme les républicains d'Amérique. Mais les eussent-ils connus qu'ils auraient refusé de les imiter. Elles constituaient un gouvernement trop pratique, trop large, pour nos idéologues qui cherchaient leur idéal dans les vagues souvenirs des républiques de Rome et d'Athènes. C'était pourtant la constitution américaine qui aurait dû leur servir de modèle, car rien n'était mieux approprié que l'œuvre de Washington, d'Adams et de Hamilton au gouvernement d'une démocratie. C'est une œuvre géniale à ce point de vue. Jamais le monde n'a vu, comme nous le disions plus haut, une réunion d'hommes comprendre, avec plus d'intelligence, l'âme du peuple, ses ambitions, ses qualités et ses défauts, combiner avec plus de prévoyance un ensemble de sauvegardes destinées à contenir la démocratie, à la défendre contre ses propres entraînements pour assurer la liberté à tous et à chacun.

Que la France est encore loin de cette admirable organisation et des mœurs politiques des Américains et des Anglais ! Dire qu'après un siècle de tâtonnements et d'essais, un grand nombre de Français en sont arrivés à ne demander qu'un pouvoir unique comme dernier mot de gouvernement du peuple par le peuple, la concentration de la souveraineté dans une seule assemblée, innovation qui serait aussi dangereuse que le pouvoir personnel d'un roi ou d'un empereur, puisque ce serait substituer au despotisme d'un seul la tyrannie d'une assemblée. Remettre le pouvoir à une seule assemblée semble très logique, conforme au principe de la souveraineté populaire, mais il ne faut pas perdre de vue, qu'en matière de gouvernement, nul pouvoir ne doit exister sans contrôle, s'il ne veut pas glisser vers l'arbitraire.

Il n'a pas manqué d'individus au Canada, qui se sont laissés prendre à la glu des mots sonores de liberté illimitée, de souveraineté du peuple, mais il s'est rencontré, heureusement en plus grand nombre, des hommes au sens pratique, qui ont su faire la part du possible et de l'irréalisable. Nos mœurs politiques sont bien supérieures à celles des Français. Se sont-elles modifiées au contact de l'esprit positif anglo-saxon ? Nous inclinons à le croire. Il y a là un problème ethnographique intéressant à résoudre, que nous ne pouvons étudier aujourd'hui. Contentons-nous de noter que de profondes divergences sur les manières d'envisager une foule de questions politiques et économiques existent entre nous et nos cousins d'outre-mer. Il est certain que, malgré le bon vouloir apporté de part et d'autre, les Canadiens s'entendent moins bien avec les Français qu'avec les

Anglais sur le terrain des affaires. Ce n'est pas là une conséquence de notre éducation, car, bien que colons anglais, nous avons continué à nous inspirer, au collège et dans la famille, des traditions françaises. Notre cœur est resté français ; notre jugement procède de l'esprit anglais qui, dans les choses ordinaires de la vie, nous a pénétrés de toutes parts. Dans tous les cas, nous avons, à force d'étude, d'application à la lumière de l'expérience, compris qu'en politique, les idéologues qui rêvent le retour à l'âge d'or sont un danger pour l'Etat, et qu'en matière de gouvernement, il est bon de viser à l'idéal, et sage de se contenter du possible.

III — *Le Tremblement de terre de* 1663 *dans la Nouvelle-France,*

par M. ALPHONSE GAGNON.

(Présenté par M. l'abbé Casgrain, le 28 mai 1891.)

Notre planète, qui nous semble stable et fixe, est — chacun le sait — loin d'être en repos. Elle a d'abord son mouvement sur elle-même et celui qu'elle accomplit autour du soleil ; puis elle a des mouvements non réguliers et des perturbations internes. Elle vibre, frissonne, tremble parfois, par suite de causes que la science pressent, mais qu'elle n'a pas encore parfaitement établies ; les nombreux volcans disséminés sur sa surface attestent le travail incessant de ses profondes régions ; enfin, il se produit en certaines contrées un mouvement de déplacement des eaux et même de continents d'une lenteur séculaire, il est vrai, mais très prononcé.

Au point de vue de l'histoire naturelle de notre globe, un ébranlement du sol n'est pas un fait extraordinaire ; il se produit tous les jours d'une manière plus ou moins sensible sur un point ou sur un autre ; mais, pour l'homme, ces agitations soudaines sont toujours une cause d'effroi, souvent de grands malheurs.

Nous avons eu, à diverses époques, des tremblements de terre dans notre pays[1], mais celui de 1663 a été particulièrement remarquable, du moins par sa durée, et a laissé une impression profonde dans les esprits, s'il faut en croire les récits du temps. Ces récits, tout extraordinaires qu'ils sont, concordent entre eux et ne laissent aucun doute sur la bonne foi et la sincérité de leurs auteurs.

Marie de l'Incarnation, que l'histoire nous représente comme une femme de grand sens, d'un caractère calme et réfléchi, a raconté avec beaucoup de détails ce mémorable événement[2]. Une année après, en 1664, le P. Lalemant, jésuite distingué, rendait public l'historique qu'il en avait fait lui-même dans les *Relations des Jésuites.* De leur côté, les annales de l'Hôtel-Dieu de cette même époque ne font que confirmer le récit de la mère de l'Incarnation et la relation du P. Lalemant.

Il n'y a donc aucun doute que, pendant près d'une année, de fortes secousses se firent sentir sur une vaste étendue de l'Amérique du Nord, lesquelles modifièrent le relief du sol en quelques endroits, et remplirent d'épouvante les habitants du pays.

Toutefois, il est bon de se rappeler les circonstances qui ont précédé et accompagné ce tremblement de terre ; cela nous aidera à mieux comprendre les relations de l'époque et à distinguer ce que la frayeur populaire, le penchant au merveilleux des habitants, ont pu ajouter à la réalité des choses.

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[1] Les principaux tremblements de terre que nous avons eus sont ceux de 1638, 1658, 1663, 1727, 1755, 1771 et 1860.

[2] "Il ne faut pas oublier, dit le P. Martin, que la vén. M. de l'Incarnation n'était pas une femme ordinaire ; que c'était une âme très élevée, un esprit distingué et nourri dans la spiritualité la plus sûre et la plus sublime." (*Relations inédites de la Nouvelle-France*, t. ii, p. 337).

D'abord, un simple ébranlement du sol est déjà bien suffisant pour produire, même chez l'homme le plus intrépide, un effet saisissant. "Cet effet, dit Humboldt, ne provient pas de ce que les images des catastrophes dont l'histoire a conservé le souvenir s'offrent alors en foule à notre imagination. Ce qui nous saisit, c'est que nous perdons tout à coup notre confiance dans la stabilité du sol. Dès notre enfance, nous étions habitués au contraste de la mobilité de l'eau avec l'immobilité de la terre. Tous les témoignages de nos sens avaient fortifié notre sécurité. Le sol vient-il à trembler, ce moment suffit pour détruire l'expérience de toute la vie. C'est une puissance inconnue qui se révèle tout à coup : le calme de la nature n'était qu'une illusion, et nous nous sentons rejetés violemment dans un chaos de forces destructives."

Une autre circonstance qui ne contribua pas peu à jeter l'alarme dans les esprits, fut l'apparition de certains phénomènes qui précédèrent le tremblement de terre. Ce fut le 5 février 1663 que les premières secousses se produisirent, mais dès le commencement de l'automne, on avait vu, écrivait le P. Lalemant, "des serpents embrasés, qui s'enlaçaient les uns dans les autres en forme de caducée, et volaient par le milieu des airs, portés sur des ailes de feu. Nous avons vu sur Québec un grand globe de flammes, qui faisait un assez beau jour pendant la nuit, si les étincelles qu'il dardait de toutes parts n'eussent mêlé de frayeur le plaisir qu'on prenait à le voir. Ce même météore a paru sur Montréal ; mais il semblait sortir du sein de la lune, avec un bruit qui égale celui des canons ou des tonnerres, et s'étant promené trois lieues en l'air, fut se perdre derrière les grosses montagnes dont cette île porte le nom."

"Mais ce qui a paru plus extraordinaire est l'apparition de trois soleils. Ce fut un beau jour de l'hiver dernier, que sur les huit heures du matin, une vapeur légère presque imperceptible s'éleva de notre grand fleuve, et étant frappée par les premiers rayons du soleil, devenait transparente, de telle sorte néanmoins qu'elle avait assez de corps pour soutenir les deux images que cet astre peignait dessus. Ces trois soleils étaient presque en ligne droite, éloignés de quelques toises les uns des autres, selon l'apparence, le vrai tenant le milieu et ayant les deux autres à ses côtés. Tous trois étaient couronnés d'un arc-en-ciel, tantôt paraissant avec les couleurs de l'iris, puis après d'un blanc lumineux, comme si au-dessous, tout proche, il y eût une lumière excessivement forte.

"Ce spectacle dura plus de deux heures la première fois qu'il parut. C'était le septième jour de janvier 1663 ; et la seconde, qui fut le 14 du même mois, il ne dura pas si longtemps, mais seulement jusqu'à ce que les couleurs de l'iris venant à se perdre petit à petit, les deux soleils des côtés s'éclipsèrent aussi, laissant celui du milieu comme victorieux."

Tous ces phénomènes semblèrent se relier si naturellement avec les convulsions de la terre qui suivirent peu après, qu'on les regarda comme des avertissements du ciel.

Les nuages, condensés par le froid, renvoient des reflets et quelquefois des images du soleil. Ces images, toujours unies entre elles par un grand cercle blanc et horizontal, sont de même hauteur, sur l'horizon, que le soleil lui-même. Ce phénomène, appelé parhélie, n'a lieu que lorsque le soleil est peu élevé sur l'horizon, et ne se montre le plus souvent que pendant l'hiver. Il dure ordinairement une, deux, trois ou même quatre heures, et son éclat n'est pas aussi éblouissant que celui du soleil. C'est, du reste, un phénomène fort rare, du moins dans les zones tempérées.

On a observé dans quelques parhélies une longue queue ou traînée lumineuse formant quelquefois une croix. Leur contour présente les mêmes couleurs que celui de l'arc-en-ciel.

Il est possible que ces nuages, qui réfléchissent ainsi le disque du soleil, étant horizontaux, nous présentent l'aspect d'objets terrestres, des montagnes, des forêts, etc.[1]

Quant aux grands "globes de flammes" qui "dardaient des étincelles", qui "faisaient un bruit égal à celui des canons et des tonnerres", ils devaient vraisemblablement être des bolides, qui sont formés d'un noyau incandescent et dont les propriétés sont d'abandonner une sorte de poussière lumineuse le long de leur trajet. Parfois ce noyau projette de côté et d'autre des étincelles ou des fragments embrasés ; d'autres fois il éclate en morceaux avec une détonation souvent extrêmement violente. Le bruit qui s'ensuit ressemble à celui du tonnerre, du canon et de la mousqueterie, suivant la distance à laquelle se trouvent les observateurs. Il arrive assez fréquemment qu'un seul bolide donne lieu à deux ou trois détonations.

Il n'est pas rare, d'ailleurs, que des tremblements de terre soient précédés de phénomènes de ce genre. Lors du tremblement de terre de Riobamba, en Colombie, en 1797, on vit à Quito un prodigieux passage d'étoiles filantes peu de temps avant la première secousse. Le 20 mars 1861, la ville de Mendoza, située en un endroit pittoresque au pied du versant oriental des Cordillères, sur la route qui mène de Buénos-Ayres à Valparaiso, fut réduite en ruines en moins d'une minute, ensevelissant 17,000 personnes sous les décombres. La veille, un météore bleu d'une grandeur prodigieuse avait traversé le ciel, éclairant de vastes espaces et se dirigeant lentement d'orient en occident. Enfin, comme il n'y a rien de nouveau sous le soleil, ces phénomènes avaient été remarqués du temps même de Pausanias, qui parle des "feux célestes qui parcourent le vaste espace des airs, laissant après eux une longue traînée de lumière ; ou de nouveaux astres qui paraissent tout à coup et nous remplissent d'effroi".

Il ne faudrait pas croire cependant qu'il est de règle que les tremblements de terre soient précédés de signes révélateurs ; ce sont plutôt des cas de coïncidence qu'une loi de la nature. Les météores, par exemple, de provenance étrangère à notre planète, se manifestent non seulement dans toutes les régions du globe, mais en toute saison, souvent par un temps serein et sans aucun nuage ; c'est un phénomène journalier, et comme il se produit pareillement tous les jours quelque ébranlement du sol sur un point quelconque de la surface terrestre, il n'est pas étonnant que des tremblements de terre soient souvent précédés de l'apparition de météores, sans qu'il faille conclure qu'il y ait quelque rapport entre eux.

Il est également constaté qu'il n'existe aucune relation quelconque entre les phénomènes souterrains et les phénomènes météorologiques, état de l'atmosphère, pression barométrique, température, électricité de l'air, vent, pluie, etc. On croit reconnaître, toutefois, que les saisons exercent une influence sur les tremblements de terre ; les statistiques, quoique incomplètes, établissent que les mouvements sismiques sont plus fréquents en hiver qu'en été. On a aussi observé que les tressaillements du sol sont plus nombreux la nuit que le jour ; cela est probablement dû au fait que le silence relatif et l'immobilité plus grande de la nuit rendent plus faciles à constater les secousses très faibles que le bruit du jour laisserait passer inaperçues.

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[1] Bernardin de Saint-Pierre mentionne quelque part dans ses *Harmonies de la Nature*, qu'un jour le célèbre peintre Vernet fut bien surpris d'apercevoir dans les cieux la forme d'une ville renversée ; il en distinguait parfaitement les clochers, les tours, les maisons. Il se hâta de dessiner ce phénomène, et, résolut d'en connaître la cause ; il s'achemina dans les montagnes où il trouva, à sept lieues de là, la ville dont il avait vu le spectre dans les cieux, et dont il avait le dessin dans son portefeuille.

Une troisième circonstance, mais procédant d'un ordre de choses différent, fit que le tremblement de terre de 1663, considéré comme un châtiment de Dieu, impressionna vivement la population de la colonie.

Nous savons tous que les hommes qui s'occupèrent du peuplement de la Nouvelle-France, aux débuts de l'établissement, prirent un soin particulier de n'y envoyer que les colons les plus recommandables. Durant près de cinquante ans on vit se perpétuer au sein de la colonie naissante l'exemple des plus grandes vertus : cela ressemblait, dit-on, à la primitive Eglise. L'égoïsme, cette plaie de la société moderne, n'avait pas alors desséché les cœurs, éteint l'enthousiasme généreux des âmes ; les actes du plus noble dévouement envers Dieu et envers la patrie étaient des actes de tous les jours, et c'est à bon droit qu'on a appelé cette époque " l'âge héroïque de notre histoire ". Avec le temps cependant et l'accroissement de la population qui, en 1663, s'élevait à 2,500 âmes, cet esprit vraiment chrétien s'était relâché au point que plusieurs, oublieux de tout devoir de conscience et malgré les avertissements, les défenses même de l'Eglise, vendaient des boissons enivrantes aux sauvages et devenaient la cause des plus grands désordres. " Il y a en ce pays, écrivait Marie de l'Incarnation, des Français si misérables et si peu touchés de la crainte de Dieu, qu'ils perdent tous nos nouveaux chrétiens, leur donnant des boissons très violentes, comme des vins et d'eau-de-vie pour tirer d'eux des peaux de castors. Ces boissons perdent tous ces pauvres gens, les hommes, les femmes, les garçons, les filles même, car chacun est maître dans la cabane quand il s'agit de manger et de boire ; ils sont pris tout aussitôt et deviennent comme furieux." Ils courent, ajoute-t-elle, avec des armes, dans les rues de Québec, et de jour et de nuit, sans que personne ne les puisse empêcher. Il s'ensuit des " meurtres " et des " brutalités monstrueuses et inouies ".

" Pour satisfaire cette passion enragée, dit de son côté le P. Lalemant, les sauvages se mettent à nu, et réduisent leurs familles à la mendicité ; ils vont même jusqu'à vendre leurs propres enfants."

Il est évident qu'il fallait prendre les moyens les plus énergiques pour arrêter le progrès du mal. L'autorité ecclésiastique fut obligée de sévir contre les prévaricateurs, et comme plusieurs persistaient dans ce commerce infâme, une peine sévère, enveloppant un grand nombre de personnes, fut prononcée. Le tremblement de terre survenant à la suite de ces circonstances, il est facile de concevoir l'impression profonde qu'il produisit chez tous ceux qui en furent témoins, étant regardé comme un châtiment de Dieu.

Les tremblements de terre n'ont sans doute rien de surnaturel ; mais, sans faire intervenir ici l'action directe et miraculeuse de la Providence, on peut toujours dire que Dieu, qui a fait la nature et les lois qui la régissent, est bien le maître de son œuvre, et quand il désire manifester aux hommes sa présence ou quelques-uns de ses attributs, il peut bien en user à l'heure et de la manière qu'il lui plaît.

Aussi, " quand Dieu parle, dit la Relation de 1663, il se fait bien entendre, surtout quand il parle par la voix des tonnerres et des tremblements de terre, qui n'ont pas moins ébranlé les cœurs endurcis que nos plus gros rochers, et ont fait de plus grands remuements dans les consciences que dans nos forêts et nos montagnes."

Ce fut le mardi gras, le 5 février 1663, sur les cinq heures et demie du soir, au moment où l'on se préparait à se livrer aux divertissements du carnaval, que se produisit la première secousse. Le temps était calme et serein. Tout à coup on entendit dans le lointain un grondement sourd comme le roulement d'un grand nombre de voitures fortement

chargées allant à grande vitesse sur des pavés. Au même instant un choc d'une extrême violence se fit sentir, et dura près d'une demi-heure ; mais les secousses ne furent particulièrement fortes que durant le premier quart d'heure, ou, selon l'expression du *Journal des Jésuites*, l'espace de deux *Miserere*.

Ce fut une panique générale ; de tous côtés on entendait mille bruits confus imitant le pétillement du feu dans les greniers, le roulement du tonnerre ; on aurait dit une grêle de pierres tombant sur les toits, ou le mugissement des vagues se brisant contre le rivage [1]. Les portes s'ouvraient d'elles-mêmes ; celles qui étaient ouvertes se refermaient. Les meubles se renversaient, le timbre des horloges sonnait, et les maisons, ébranlées et agitées comme des arbres lorsqu'il fait un grand vent, semblaient être sur le point de s'écrouler. Les toits se courbaient en bas d'un côté, puis se renversaient de l'autre. Les clochers des églises se balançaient et les cloches sonnaient d'elles-mêmes. La frayeur s'était emparée même des animaux domestiques qui sortaient des maisons ou y entraient en poussant des cris et des hurlements lamentables.

Les habitants consternés crurent d'abord à un vaste incendie, ou à une attaque subite des Iroquois. Mais quand on fut dehors on reconnut aussitôt la véritable cause de ce bouleversement. Un nuage de poussière s'était répandu dans l'air. Le sol bondissait sous les pieds, puis les secousses s'affaiblissaient et formaient un mouvement d'ondulation semblable aux flots de la mer. Les palissades dansaient d'une façon incroyable. Le désordre dans les forêts n'était pas moins grand. Les arbres se heurtaient avec fureur ; les troncs, se détachant de leur place, se renversaient les uns sur les autres avec une violence qui fit dire aux Indiens que la forêt était ivre. Où il y avait une forêt on ne voyait plus que des troncs renversés [2].

Les hommes, les femmes et les enfants ne trouvaient de sûreté nulle part, et ils craignaient à chaque instant d'être ensevelis sous des ruines ou de voir la terre s'entr'ouvrir pour les abîmer. Les uns, tombant à genoux, se frappaient la poitrine en implorant la miséricorde de Dieu ; les femmes tombaient en défaillance ; tous enfin crurent que la fin du monde arrivait.

Le spectacle n'était pas moins terrible sur l'eau que sur la terre. Les glaces du fleuve, épaisses de plusieurs pieds, étaient soulevées et brisées comme dans une violente débâcle. Des nuages de fumée, de boue ou de sable jaillissaient des crevasses ainsi faites [3]. Les poissons eux-mêmes, saisis de frayeur au milieu de ce déchaînement des éléments, s'élançaient hors de l'eau, et l'on entendit les rauques soufflements des marsouins dans les eaux du lac Saint-Pierre, où leur présence n'avait jamais été signalée auparavant.

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[1] "La nature du bruit dont les tremblements de terre sont accompagnés, dit Humboldt, varie beaucoup ; il roule, il gronde, il résonne comme un cliquetis de chaînes entre-choquées ; il est saccadé comme les éclats d'un tonnerre voisin, ou bien il retentit avec fracas comme si des masses de roches vitrifiées se brisaient dans les cavernes souterraines."

[2] "Sur la côte sud du fleuve Saint-Laurent, on voit encore ce qu'on appelle dans le pays l'*abbatis du diable*, c'est-à-dire que sur trois lieues de front, sur plus de cent lieues de longueur, tous les arbres de cette immense forêt furent abattus, et ne se sont jamais relevés." (Latour, p. 185.)

Ce dernier phénomène fut également remarqué lors du tremblement de terre qui ravagea la vallée du Mississipi en 1811. Nombre d'arbres y périrent, leurs racines ayant été arrachées et brisées par les ondulations qui se succédèrent durant trois mois consécutifs. On vit aussi à cette occasion de grandes quantités d'eau mêlée de sable, de boue et de parcelles de matière charbonneuse, jaillir du sol.

[3] Il est digne de remarque que lorsque, dans les ondulations terrestres, l'extrême limite de l'élasticité des corps est dépassée, et que des ruptures s'opèrent, les crevasses livrent passage à des gaz.

Cette première secousse dura près d'une demi-heure ; toutefois ce ne fut que durant l'espace d'un quart d'heure qu'elle se fit sentir dans toute sa violence. Les sauvages chrétiens regardaient cet événement comme un châtiment de Dieu qui les punissait des excès qu'ils avaient commis en buvant de l'eau-de-vie que les mauvais Français leur avaient donnée. Les sauvages payens croyaient que c'étaient les âmes de leurs ancêtres qui voulaient rentrer en possession de leurs anciennes terres de chasse, et ils faisaient de bruyantes décharges de mousqueterie pour les forcer à retourner au pays des âmes.

A peine commençait-on à se remettre de la panique causée par la première secousse, qu'on en éprouva une seconde sur les huit heures du soir, laquelle redoubla de violence deux fois dans une heure. Il y eut plusieurs autres ébranlements, d'une intensité variable, cette même nuit ; une personne en compta trente-deux, mais six seulement furent bien sensibles.

Ce qu'il y eut aussi de remarquable dans ce tremblement de terre, ce fut sa longue durée. Les secousses se firent sentir durant l'espace de sept mois. Parfois ce n'était qu'un simple frémissement du sol ; d'autres fois c'étaient des ébranlements rudes et saccadés. " En certains endroits, dit le P. Lalemant, comme dans les montagnes que nous avons à dos, le tintamarre et le trémoussement y ont été perpétuels pendant un long temps ; en d'autres endroits, comme Tadoussac, il y tremblait d'ordinaire deux ou trois fois le jour avec de grands efforts, et nous avons remarqué qu'aux lieux plus élevés l'émotion était moindre qu'au pays plat."

" Parmi toutes ces terreurs, dit Marie de l'Incarnation, on ne savait à quoi le tout aboutirait. Quand nous nous trouvions à la fin de la journée, nous nous mettions dans la disposition d'être englouties en quelque abîme durant la nuit ; le jour étant venu, nous attendions la mort continuellement, ne voyant pas un moment assuré à notre vie. En un mot, on séchait dans l'attente de quelque malheur universel."

Le nombre et la durée des secousses des tremblements de terre sont très variables. Généralement la commotion est unique, ou il s'en produit deux ou trois au plus. Mais il arrive parfois que les vibrations se succèdent à des intervalles assez rapprochées pendant des mois et même des années. Le tremblement de terre de Java, du 5 janvier 1699, ne comprit pas moins de 208 violentes secousses. En 1856, il y eut à Honduras 108 secousses dans une seule semaine, et aux îles Sandwich, en 1868, un même tremblement de terre dura plusieurs mois de suite, et on compta 2,000 secousses dans un mois. Du 28 octobre 1746 au 27 février 1747, on compta également, au Pérou, 451 commotions. Le tremblement de terre qui paraît avoir duré le plus longtemps est celui de Calabre, qui ébranla le sol presque quotidiennement de 1783 à la fin de 1786.

On sait que la région de la baie Saint-Paul, à vingt lieues et plus en aval de Québec, est le foyer ordinaire d'où naissent nos tremblements de terre ; mais comme une oscillation, un mouvement de l'écorce terrestre ne peut ébranler un point unique et restreint du globe, et doit nécessairement se développer sur une étendue plus considérable, l'aire d'ébranlement des tremblements de terre de 1663 embrassa la chaîne entière des Laurentides, et modifia la surface du sol sur plusieurs points.

Les secousses se firent sentir à Montréal, mais sans aucun effet désastreux ; de fait, elles ne furent pas aussi violentes à Montréal qu'aux Trois-Rivières et à Québec.

Les détails suivants furent transmis des Trois-Rivières à Québec par une personne digne de foi :

" La première secousse et la plus rude de toutes commença par un bruissement semblable à celui du tonnerre ; les maisons avaient la même agitation que la cime des arbres pendant un orage, avec un bruit qui faisait croire que le feu pétillait dans les greniers.

" Ce premier coup dura bien une demi-heure, quoique sa plus grande force ne fût proprement parler que d'un petit quart d'heure. Il n'y en eut pas un qui ne crût que la terre dût s'entrouvrir. Au reste, nous avons remarqué que, comme ce tremblement de terre est quasi sans relâche, aussi n'est-il pas dans la même égalité : tantôt il imite le branle d'un grand vaisseau qui se manie lentement sur ses ancres, ce qui cause à plusieurs des étourdisements de tête ; tantôt l'agitation est irrégulière et précipitée par divers élancements, quelquefois assez rudes, quelquefois plus modérés. Le plus ordinaire est un petit trémoussement qui se rend sensible lorsque l'on est hors du bruit et en repos. Selon le rapport de plusieurs de nos Français et de nos sauvages, témoins oculaires, bien avant dans notre fleuve des Trois-Rivières, à cinq ou six lieues d'ici, les côtes qui bordent la rivière de part et d'autre, et qui étaient d'une prodigieuse hauteur sont aplanies, ayant été enlevées de dessus leurs fondements et déracinées jusqu'au niveau de l'eau. Ces deux montagnes, avec toutes leurs forêts, ayant été ainsi renversées dans la rivière, y formèrent une puissante digue, qui obligea ce fleuve à changer de lit et à se répandre sur de grandes plaines nouvellement découvertes, minant néanmoins toutes ces terres éboulées, et les démêlant petit à petit avec les eaux de la rivière, qui en sont encore si épaisses et si troubles, qu'elles font changer de couleur à tout le grand fleuve de Saint-Laurent. Jugez combien il faut de terre tous les jours pour continuer depuis près de trois mois à rouler ses eaux toujours pleines de fange.

" L'on voit de nouveaux lacs où il n'y en eut jamais ; on ne voit plus certaines montagnes qui sont engouffrées ; plusieurs sauts sont aplanis ; plusieurs rivières ne paraissent plus ; la terre s'est fendue en bien des endroits et a ouvert des précipices dont on ne trouve point le fond. Enfin il s'est fait une telle confusion de bois renversés et abîmés, qu'on voit à présent des campagnes de plus de mille arpents toutes rases comme si elles étaient toutes fraîchement labourées, là où peu auparavant il n'y avait que des forêts[1] ".

La partie du pays qui semble avoir le plus souffert de ces convulsions de la nature est celle comprise entre le cap Tourmente et Tadoussac.

On signale un fait singulier arrivé dans ce premier endroit au commencement de juillet. Pendant plusieurs jours il y eut des tourbillons et des orages furieux du côté du cap ; puis, une nuit, les habitants entendirent un bruit épouvantable causé par un torrent d'eau qui tomba des montagnes avec une abondance et une force extraordinaires, déracinant les arbres, démolissant et emportant les habitations qui se trouvaient sur son passage. Une grange qu'on venait de terminer, fut transportée tout entière à une distance de deux lieues, où elle se brisa sur les roches. Les nombreux bestiaux qui paissaient dans les belles prairies qui se voyaient là furent rejetés pêle-mêle à travers les arbres renversés, et emportés par la rapidité des eaux. Plusieurs cependant purent être retirés de cette position, après le passage du torrent. Les semences furent ruinées, la terre étant emportée sur une superficie de douze arpents, au point de laisser la roche toute nue.

C'est surtout dans le voisinage des côtes que les affaissements ou effondrements du

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[1] Relation de 1663.

sol sont les plus fréquents. Vers la côte Saint-Paul, deux grands caps formant un quart de lieue de tour, se détachèrent de leur base, s'enfoncèrent dans le fleuve, puis en ressortirent pour former un îlot, ayant conservé leurs arbres et leur verdure.

" J'ai su, écrit encore Marie de l'Incarnation, de ceux qui ont remonté le fleuve en vaisseaux, qu'en plus de douze endroits d'ici à Tadoussac, qui est distant de Québec de trente lieues, les grands fracas causés par les secousses de la terre en plusieurs endroits, principalement vers les deux caps dont j'ai parlé, ont fait que les montagnes de roches se sont ouvertes. Ils ont vu quelques petites côtes ou éminences qui se sont détachées de leur fondement et qui ont disparu, faisant de petites anses où les barques et les chaloupes se pourront mettre à l'abri durant les tempêtes. C'est une chose si surprenante qu'on ne la peut concevoir, et tous les jours on apprend de semblables prodiges. L'on avait beaucoup de crainte que ces bouleversements arrivés sur les côtes du grand fleuve n'en empêchassent la navigation, mais enfin on ne croit pas qu'ils puissent nuire, pourvu qu'on ne voyage point durant la nuit, car alors il y aurait du péril."

Dans le voisinage de Tadoussac, le sol, de même que les barques sur le fleuve en amont, se couvrirent en six heures d'une couche de cendre d'un pouce d'épaisseur.

Durant l'été on ressentit aussi plus d'une fois sur le fleuve les effets du tremblement de terre, qui jeta la terreur parmi les matelots et les passagers.

Généralement les navires surpris par un tremblement de terre éprouvent des chocs brusques et violents comme s'ils touchaient quelque bas-fond.

Les exhalaisons qui s'étaient échappées de la terre sur divers points du pays avaient d'abord causé une si grande sécheresse que toutes les moissons avaient jauni ; cependant, il tomba dans le cours de l'été des pluies tellement bienfaisantes que cette même année fut remarquable par l'abondance de la récolte.

Le tremblement de terre de 1663 se fit sentir jusque dans la Nouvelle-Angleterre, l'Etat de New-York et l'Acadie, mais en diminuant d'intensité à mesure qu'il s'éloignait de son point de départ. A Boston, on éprouva d'abord une forte secousse vers cinq heures et demie du soir, une autre pendant la nuit, puis le 28 du même mois. On calcule que les ondes d'ébranlement rayonnèrent sur une superficie de 40,000 lieues[1].

Il est bien étonnant qu'il n'y ait pas eu de perte de vie au milieu de tous ces bouleversements. La population était peu nombreuse, fort dispersée, et partant moins exposée. Il peut arriver aussi qu'il y ait eu dans les récits du temps quelques exagérations causées par la nouveauté du phénomène, par la frayeur des habitants et la crédulité populaire ; mais enfin, tout considéré, il ressort de l'étude attentive et comparée des documents de l'époque, la preuve incontestable que ce tremblement de terre fut remarquable par son intensité, par sa durée et les circonstances extraordinaires qui le précédèrent et l'accompagnèrent.

Il est bon de remarquer que non seulement Marie de l'Incarnation, le P. Ragueneau, de l'Hôtel-Dieu, et le P. Lalemant rapportaient ce qu'ils voyaient et éprouvaient eux-mêmes, mais encore ce qu'on leur écrivait en même temps de tous les points du Canada. Il ne semble pas qu'ils aient exagéré, car en 1665, deux Français dignes de foi, qui avaient parcouru toutes les localités de Tadoussac et de la Malbaie, assuraient au P. Le Mercier, qui avait remplacé le P. Lalemant dans la charge de supérieur des missions, que " la Rela-

[1] L'abbé Ferland, *Cours d'Histoire du Canada.*

tion de l'année 1663 n'avait exprimé qu'à moitié les désordres causés par le tremblement de terre en ces quartiers". L'historien Charlevoix, dont on connait l'étonnante érudition, parle de ces récits, et n'a pas la pensée de douter de leur exactitude. Il était d'autant plus en état d'apprécier leur valeur que lui-même vint au Canada à une époque où vivaient encore des témoins de ces événements.

Des phénomènes identiques, d'ailleurs, ont été observés dans beaucoup de tremblements de terre.

En 1878, à Battang, en Chine, le sol était agité comme une mer battue par l'ouragan ; et en 1812, le sol des Caracas faisait l'effet d'un liquide en ébullition. En 1759, au Mexique, durant une terrible secousse de tremblement de terre, accompagnée d'un bruit formidable, des roches embrasées furent projetées dans les airs avec beaucoup de cendre.

Durant le tremblement de terre qui affecta le delta de l'Indus, le 16 juin 1819, une surface de 242 lieues carrées disparut sous les eaux de la mer. Celui du 24 mai 1750 mit à sec le port de la Conception, au Chili. Lors du tremblement de terre qui ravagea la Calabre au siècle dernier, les sommets de quelques montagnes s'effondrèrent et le relief du sol fut véritablement modifié. Les arbres s'inclinaient au point que leur cime arrivait à toucher la terre, puis se redressaient après le passage de l'onde.

Je pourrais citer bien d'autres exemples de ce genre causés par les tremblements de terre, mais ceux que je viens d'indiquer, joints à ceux qui accompagnent le cours de cette étude, suffisent pour faire voir que les modifications et les dislocations du sol et d'autres effets provenant du tremblement de terre de 1663, tels que rapportés par les témoins oculaires, n'ont rien d'invraisemblable ; qu'ils ont pu se produire et se sont réellement produits[1].

Les plus grandes calamités de ce genre dont l'histoire ait conservé le souvenir sont celles qui eurent lieu en l'an 19, sous Tibère, en Italie, et plus tard, en l'an 52, sous l'empereur Justin, en Asie Mineure et en Syrie ; on rapporte que deux cent mille personnes furent victimes de ces tremblements de terre. En 526, cent vingt à deux cent mille personnes périrent sur le littoral de la Méditerranée par suite d'un seul tremblement de terre, et celui qui se fit sentir en Sicile, le 9 janvier 1693, détruisit quarante-neuf villes et un grand nombre de villages, et coûta la vie à plus de quatre-vingt-treize mille habitants. Le tremblement de terre qui détruisit Lisbonne en 1755 fit de trente à quarante mille victimes. Cette terrible catastrophe se fit sentir aux Antilles, dans les îles Britanniques, en Finlande, en Thuringe, dans les Alpes, en Autriche et dans le nord de l'Italie ; on en éprouva même au Canada une forte secousse. Trois coups, chacun estimé à quatre secondes, arrivés le 26 mars 1812 dans la contrée de Caracas, causèrent la mort de plus de vingt mille personnes.

Il ne serait peut-être pas hors de propos d'ajouter ici, en terminant, que les mouvements que subit le sol n'ont pas tous le même caractère.

Il y a des tremblements de terre qui se manifestent de bas en haut, et ces chocs verticaux, connus sous le nom de *succussions*, sont parfois assez forts pour projeter en l'air de lourds objets. Ces secousses verticales sont souvent les plus violentes et les plus redoutables. Lors du tremblement de terre de Riobamba, les cadavres de plusieurs habitants

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1 M. de la Potherie écrivait dans le journal qu'il fit de son voyage au Canada en 1700, que "partout où il travailla, la terre était encore bouleversée par le tremblement de terre de 1663".

Histoire manuscrite du Séminaire.

furent lancés sur une colline d'au-delà de 330 pieds. En Calabre, en 1783, on vit des maisons sauter comme si elles avaient été projetées par l'explosion d'une mine.

D'autres fois ce sont des mouvements ondulatoires se propageant horizontalement, suivant une ligne droite ou rayonnant autour d'un centre, à la manière des ondulations de la surface de l'eau. Dans ce cas, si les vibrations se prolongent durant quelques minutes, elles causent un malaise semblable au mal de mer. C'est justement ce qui a été observé lors du tremblement de 1663, la nature des mouvements ayant été ondulatoires. "Quand on levait le pied pour marcher, dit le *Journal des Jésuites*, on sentait la terre qui suivait, se levant à mesure qu'on haussait les pieds, et quelquefois frappant les plantes assez rudement, et autres choses semblables fort surprenantes."

Il arrive aussi que ces deux modes d'ébranlement se croisent et se combinent par l'effet de plusieurs commotions simultanées, partant de centres distincts situés à des profondeurs et à des distances inégales. Ces deux derniers caractères semblent s'être également produits en 1663, car on écrivait des Trois-Rivières que "l'agitation tantôt imitait le branle d'un grand vaisseau qui se manie lentement sur ses ancres, ce qui cause à plusieurs des étourdissements de tête ; tantôt l'agitation est irrégulière et précipitée par divers élancements, quelquefois assez rudes, quelquefois plus modérés". Le plus souvent ces commotions du sol se réduisent à de simples frémissements qui ne sont remarqués que par des observateurs attentifs.

Il est bien difficile de préciser les causes des tremblements de terre. C'est une question qui, cependant, touche de bien près à notre existence.

D'après certains géologues, l'écorce terrestre est soumise à des effets de tension de nature à provoquer, de temps à autre, des ruptures d'équilibre, et, par suite, des plissements, des fractures, avec déplacements et effondrements. On comprend aisément que ces actions ne peuvent avoir lieu sans causer des ébranlements qui se trahissent à sa surface par de violentes secousses.

Les tremblements de terre des régions volcaniques, sont en général fréquents, violents, et causés par le mouvement des vapeurs autour des volcans.

Ailleurs, dans les terrains stratifiés, ils sont causés par la rupture d'équilibre dans les masses solides, provenant de toute cause capable de produire des changements de niveau ou de position dans l'intérieur de la terre, du sous-minage des strates par des agents quelconques, d'un changement de température dans certains cas locaux, ou enfin du progrès de refroidissement de notre globe. Cette dernière cause, dit M. Dana, le plus éminent des géologues américains, doit avoir été la plus commune, et avoir occasionné la plus grande partie des oscillations et des soulèvements qui s'exercent sur la terre.

On conçoit qu'une contraction, un entassement brusque d'une région souterraine, doit produire à sa surface un ébranlement plus ou moins considérable, mais dans ce cas cet ébranlement devrait, ce semble, s'épuiser en quelques chocs immédiats et n'embrasser qu'une faible étendue ; cela n'explique guère ces secousses réitérées qui durent parfois des semaines et des mois entiers, ou qui se répètent à des périodes rapprochées. On doit donc penser que l'eau, par exemple, exerce un rôle important sur les causes des tremblements de terre.

C'est un fait reconnu que la température du sol s'élève à mesure qu'on descend plus bas. On calcule que cet accroissement de la chaleur est d'environ un degré centigrade

par cent pieds, quelquefois plus, ce qui suppose l'existence d'un foyer de chaleur extraordinaire dans le noyau central de la terre, ou tout au moins l'existence d'une couche liquide continue d'une certaine épaisseur entre le noyau terrestre et l'écorce, solides tous deux, ou enfin l'existence, en certains lieux, de lacs souterrains de matières fluides ou en fusion. Quoi qu'il en soit de ces trois hypothèses, il est hors de doute qu'une couche non solide existe à une profondeur quelconque, et qu'elle n'est autre chose que la partie non encore refroidie et solidifiée du globe primitivement fluide.

De son côté, l'eau, obéissant aux lois de la pesanteur et de la capillarité, tend toujours à descendre, principalement sous les chaînes de montagnes et dans les régions disloquées, malgré certains obstacles, de la surface froide du globe jusqu'aux régions profondes et chaudes ; arrivée à une température explosive, elle acquiert une puissance capable de produire les plus grandes commotions. Les vapeurs, gênées pour s'échapper, déplacent brusquement les murailles de leur prison, s'écoulent, par ruptures et soubresauts, de cavités en cavités, et donnent lieu à la surface du sol à une série d'ébranlements accompagnés de bruits étranges. Ce qui semble confirmer cette hypothèse, c'est qu'on a vu jaillir de certaines crevasses ouvertes par un tremblement de terre, en dehors des régions volcaniques, non seulement de l'eau chaude, mais des matières gazeuses. Lors du tremblement de terre qui, le 25 décembre 1884, ravagea une partie de l'Andalousie, des crevasses de plusieurs milles de longueur et larges de plusieurs pieds s'ouvrirent ; l'une d'elles livra passage à des gaz fétides à odeur d'hydrogène sulfuré, et il en jaillit une source d'eau sulfureuse avec une température de 107 degrés Fahrenheit. Plusieurs sources thermales s'échauffèrent encore davantage. Le P. Lalemant, Marie de l'Incarnation et autres parlent également des crevasses ou "abîmes nouveaux d'où sortaient des vapeurs ensoufrées", des "bouffées de chaleur étouffantes qui s'élevaient de la terre", qui se produisirent, et des sources ou "nouvelles fontaines" qui apparurent à la suite de notre tremblement de terre, de nos rivières dont "les eaux furent corrompues", etc.

Cette théorie de l'action de la vapeur surchauffée qu'un éminent géologue, M. Daubrée, a exposée tout récemment, explique mieux que les ébranlements intérieurs des masses solides, toutes les particularités des tremblements de terre, "leur régime, simulant des coups de bélier, leur violence, leur succession fréquente, leur récurrence sur les mêmes régions depuis bien des siècles ; ils expliquent aussi leur prédilection pour les contrées disloquées, surtout si les dislocations sont récentes, et leur subordination aux cassures profondes de l'écorce terrestre. Les tremblements de terre paraissent être comme des éruptions volcaniques étouffées, parce qu'elles ne trouvent pas d'issue".

"Dans la profondeur des régions disloquées, nous trouvons, dit encore ce savant géologue, les trois caractères suivants : des cavités, de l'eau et une haute température, et, par suite, un agent capable, à un moment donné, de produire des effets dynamiques des plus considérables."

Dans ces conditions, toute cette région si tourmentée, si brisée, qui s'étend depuis le cap Tourmente jusqu'à Tadoussac, serait donc des plus propres à favoriser l'alimentation en eau des régions profondes et chaudes, et il est permis de croire que la vapeur d'eau s'y est produite en abondance et a été la cause du célèbre tremblement de terre de 1663.

Cela est d'autant plus vraisemblable que ce tremblement de terre s'étant propagé sur une grande étendue, de pareils ébranlements doivent être causés à de grandes profon-

deurs au-dessous de la surface du sol, en des lieux où, d'après ce que nous savons de la constitution physique de la croûte terrestre, règne certainement une température élevée, et où se trouvent réunis tous les éléments de nature à produire de terribles explosions. Un peu de vapeur produite et emprisonnée suffit pour ébranler des montagnes.

Toutefois, l'objet de cette étude est de rappeler des faits, non de les expliquer. D'ailleurs, le plus clair de la richesse des savants consiste dans la constatation d'un certain nombre de faits. Les explications dont ils accompagnent ces constatations ne sont le plus souvent que des hypothèses, parfois très ingénieuses, mais qu'il faut toujours accueillir avec réserve [1].

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[1] Il serait bien désirable, dans l'intérêt de la science et du progrès dans notre pays, que des instruments sismographiques fussent placés sur divers points des Laurentides, au moins dans la région de la baie Saint-Paul, qui est si souvent agitée. Nul doute qu'on y ferait des observations fort intéressantes sur la fréquence, la direction et l'intensité des phénomènes sismiques.

Ainsi, il y a le sismographe électro-magnétique de M. Palmieri, qui se compose de deux parties distinctes ; l'une joue le rôle de moteur ou de *transmetteur :* c'est celle qui reçoit et transmet les mouvements sismiques, verticaux ou horizontaux, chocs ou ondulations ; la seconde, *l'enregistreur*, marque les instants précis du commencement et de la fin du phénomène : elle est commune aux secousses verticales et aux secousses horizontales. Le sismographe de M. Palmieri fonctionne depuis 1856 à l'observatoire du Vésuve, où il enregistre les plus faibles trépidations du sol si souvent agité du volcan.

Il y a aussi l'appareil imaginé par M. J. Galli, qui enregistre les ondulations les plus faibles. Ses petites dimensions qui permettent de le placer à l'abri des mouvements de l'air, sous une cage de verre de 24 à 28 pouces de hauteur, en rendent l'emploi très commode. Ce sismographe fonctionne dans plusieurs villes de l'Italie.

On pourrait tout au moins y installer de simples pendules qui donnent aussi des résultats satisfaisants.

Il me semble qu'il appartiendrait à la commission Géologique du Canada de prendre l'initiative dans cette affaire, et les observations pourraient lui être transmises directement, ou adressées à l'observatoire Météorologique de Québec.

IV — *Feu P.-J.-O. Chauveau,*

Par son successeur, M. L.-O. DAVID.

(Lu le 29 mai 1891.)

Lorsque le marquis de Lorne voulut signaler son passage dans notre pays par la fondation d'une œuvre utile et nationale, il eut la pensée de donner à cette jeune population, qu'il voyait lancée à toute vapeur dans le tourbillon du progrès matériel, un moyen puissant de développer chez elle la vie de l'intelligence. Il songea à réunir dans un centre commun toutes les forces intellectuelles qu'il voyait éparses autour de lui, pour en faire un faisceau de lumière, un foyer de chaleur, une source de vitalité littéraire et scientifique. Il prévut ce que pourraient produire pour le bien et la grandeur de ce pays le ralliement autour du même drapeau, le travail en commun des représentants du génie français et du génie anglais, la rivalité dans le domaine des lettres des descendants des deux grands peuples qui ont tant fait pour la civilisation.

Tout le pays applaudit à cette belle et généreuse idée.

Les écrivains surtout comprirent que c'était une bonne fortune pour eux, la récompense et la sanction de leurs peines et de leurs labeurs. Ils sont pénibles les travaux du poète et de l'écrivain qui veulent se livrer à leurs goûts favoris, dans un pays jeune et pauvre, où chacun n'a d'autre préoccupation que de gagner son pain quotidien. Il faut du courage pour lutter contre les préjugés et l'indifférence publique, pour rester en dehors du courant qui entraine tous les hommes à la poursuite du bien être matériel. Oui, elles sont rudes les épreuves de ceux qui les premiers tracent le sillon où d'autres plus tard récolteront à pleines mains.

C'est la loi de Dieu, qui veut que rien de grand et de durable n'arrive dans le monde sans le dévouement et le sacrifice.

Aussi, quand le marquis de Lorne jeta les yeux autour de lui pour faire le choix de ceux qui devaient former le noyau de la Société Royale, il n'oublia pas ces ouvriers de la première heure dont je viens de parler, ces généreux pionniers de notre littérature. Il ne manqua pas de remarquer, planant au-dessus de ses contemporains, dans le cercle lumineux d'une vie tout entière consacrée au culte des lettres, l'homme éminent dont la Société Royale a su reconnaître le mérite en le nommant son président, et en l'entourant d'un respect et d'une vénération qui furent l'une des grandes récompenses de sa vie.

Je ne sais comment remercier la Société de l'honneur qu'elle m'a fait en m'appelant à prendre parmi ses membres la place de ce patriarche de la littérature canadienne, de l'honorable M. Chauveau. Cette succession m'impose des obligations dont le fardeau m'écraserait si votre bienveillance et ma bonne volonté ne suppléaient à mon insuffisance.

La mort en frappant certains hommes crée un vide plus difficile à remplir que la fosse

où reposent leurs cendres. On leur succède sans les remplacer, et le seul moyen d'amoindrir la perte que la société a faite est de perpétuer le souvenir de leurs vertus et de leurs talents.

Ces hommes ne meurent pas tout entiers ; leur chair meurt, mais au-dessus du tombeau qui la renferme leur esprit flotte, brille, et continue d'illuminer le sillon qu'ils ont tracé sur la terre. La matière est détruite, mais ce qu'il y avait chez eux d'immortel et d'impérissable échappe à la destruction. Leurs grandes pensées, leurs nobles sentiments, ce qui constituait leur vie intellectuelle et morale, survit pour nous éclairer, nous fortifier et nous indiquer le chemin du devoir. Ce sont des jalons, des flambeaux que la Providence met sur la route des générations futures.

L'arbre est mort, mais le fruit nous reste, et ce fruit renferme mille germes de vie. Il faut prendre garde de laisser ces germes précieux se perdre au milieu des pierres et des ronces de la vie, car ce serait une perte irréparable pour la société et une injustice pour ceux dont la vie nous a été utile. L'exemple et le modèle jouent un grand rôle dans le monde pour le bien et pour le mal ; on suit, on imite ; on marche sur les traces de ceux qui nous ont précédés, et l'émulation créée par l'histoire de leurs grandes œuvres enfante souvent des prodiges.

Les lauriers d'Aristide empêchaient Thémistocle de dormir ; le souvenir d'Alexandre le Grand qui, à trente ans, avait conquis le monde, jetait une ombre sur la couronne de laurier dont le front de César était ceint.

J'espère donc me faire pardonner de remplacer l'homme distingué qui fut votre président honoré, en vous parlant de lui, en faisant ressortir surtout ce qu'il y a de beau, de bon et d'utile dans sa longue et noble existence.

Il y a deux manières d'apprécier la vie des hommes célèbres, l'analyse et la synthèse. Par la première on entre dans les détails, on entasse les dates et les faits et on en tire des inductions. Par la seconde on considère l'ensemble, on groupe, on concentre les faits, on reste dans les grandes lignes ; c'est celle que j'adopte en ce moment.

Dans le concert d'éloges qui s'est élevé autour de la tombe de M. Chauveau, aucun des faits, des détails de nature à le faire connaître n'a été oublié. Toute la presse du pays a loué ses talents multiples, la souplesse d'esprit qui lui a permis de tout apprendre et de tout aborder, de se livrer aux études les plus variées, de briller dans les lettres, l'éloquence, l'histoire, le droit et la politique.

Il a occupé chez nous les positions les plus élevées. Député à l'âge de vingt-trois ans dans l'ancien parlement des Canadas unis, il devint secrétaire d'Etat, plus tard surintendant de l'Instruction publique, et après l'établissement de la Confédération, premier ministre de la province de Québec, et plus tard encore président du sénat. Il a rempli toutes ces charges avec honneur pour lui et ses compatriotes ; mais, disons-le avec plaisir, pour la consolation de ceux qui se livrent dans ce pays aux travaux modestes et ingrats de la science et des lettres, ce n'est pas dans l'arène brûlante de la politique que la postérité ira chercher ses titres de gloire, mais dans les champs fleuris de la littérature. Elle a fait connaître son jugement avant que la tombe du défunt fût recouverte.

Pour qui ces hommages venus de toutes les parties du pays, ces députations, ces éloges et ces couronnes ? Pour l'homme d'Etat ? Non ; pour l'écrivain, l'orateur. L'erreur n'était pas possible ; le témoignage était trop clair, trop éclatant ; l'homme politique paraissait complètement oublié. Aussi, il faut bien l'avouer, il a été homme politique par

devoir, par nécessité, parce que, dans un pays comme le nôtre où la carrière des lettres est si ingrate, les besoins de l'existence poussent le talent hors de ses voies naturelles.

M. Chauveau n'avait ni le tempérament, ni la hardiesse, ni l'esprit vigoureux nécessaires aux chefs de parti. Les roueries et les violences répugnaient à sa nature sensible. Aussi, il se sentait déplacé, déclassé dans ce monde tourmenté et passionné, plein de qualités et de défauts, et se hâtait d'en sortir aussitôt qu'il le pouvait, pour se livrer à ses chères études, à ses douces méditations. Il trouvait dans la compagnie de Virgile et d'Homère, de Racine et de Fénelon, de Montalembert et de Lacordaire des jouissances que la conversation de la plupart des politiciens ne lui procurait qu'à demi.

D'ailleurs, ce n'était pas un homme d'action, mais un penseur, un poète vivant d'idéal et de sentiment, dominé par l'amour du beau et du vrai, plus sensible aux charmes d'un jolie pièce de vers qu'aux beautés froides et trop souvent incomprises d'une loi municipale ou électorale. La nature l'avait fait poète, les muses s'étaient penchées sur son berceau, lui avaient mis au front le sceau de sa destinée, et soufflé dans l'âme le feu sacré.

Doué des facultés les plus brillantes, il travailla tous les jours de sa vie à les développer par un travail incessant, opiniâtre. Amant passionné des lettres antiques, il ne cessa de les étudier, de s'en approprier les beautés. Il était de ceux qui croient que l'étude des classiques est et sera toujours le moyen le plus efficace de former et d'embellir l'esprit humain, de lui inspirer le goût du beau et du vrai. C'était à ses yeux la source la plus féconde des grandes inspirations, le jardin des Hespérides où l'humanité devait aller cueillir les fruits d'or de la poésie. Cependant, il était de son temps et savait concilier son amour du passé avec l'avancement des idées et les exigences de notre siècle. Il reconnaissait que le progrès matériel et le mouvement scientifique et industriel qui sont en voie de changer la face de la terre exigent que l'on donne à l'enseignement moderne un caractère plus pratique.

Il était trop droit, trop sincère pour s'enfermer dans des idées, des opinions surannées ; il écoutait, réfléchissait, et ne rejetait jamais de parti pris les idées nouvelles que les flots du temps apportent.

Cette disposition d'esprit explique l'influence qu'il n'a cessé d'exercer dans notre monde littéraire, et comment il a été le trait-d'union entre l'ancienne et la nouvelle école.

J'appelle l'ancienne école la pléiade d'écrivains consciencieux et dévoués qui de 1830 à 1860 jetèrent les fondements de notre littérature nationale, et qui compte parmi ses disciples les plus brillants les Garneau, les Parent et les Crémazie... J'appelle la nouvelle école la phalange puissante qui depuis 1860 a donné à notre littérature une poussée si vigoureuse, et dont Fréchette est le chef couronné. M. Chauveau appartenait à la première par ses idées conservatrices et son amour des classiques, à la seconde par l'élégance du style, la précision de l'expression et la vivacité des inspirations.

C'est dans ses discours qu'il faut étudier M. Chauveau pour apprécier son talent, la nature de son esprit ; c'est là qu'il faut aller chercher la mesure de ses facultés intellectuelles. Son éloquence constitue la meilleure part de sa gloire littéraire ; elle lui survivra dans des œuvres que les générations futures ne cesseront de lire et d'admirer. Elle est éclatante et grandiose comme la nature au milieu de laquelle il est né ; on dirait que le souffle puissant, qui circule à travers les ruines de la vieille cité de Champlain, lui inspire les images brillantes, les figures frappantes dont ses discours sont émaillés.

Aussi, il a été durant le tiers d'un siècle l'orateur national par excellence, l'interprète de nos pensées et de nos sentiments, la personification la plus vivante, la plus autorisée de nos traditions religieuses et nationales, de nos douleurs et de nos joies patriotiques, de notre enthousiasme pour les gloires du passé et de notre confiance dans l'avenir. Plus d'un monument élevé à Québec transmettra à la postérité le souvenir de l'éloquence patriotique de M. Chauveau.

Durant quarante ans, il a été notre orateur littéraire et académique le plus parfait, et ses discours resteront comme des modèles sous le rapport du style comme du sentiment et de l'inspiration.

Admirons donc l'écrivain, le poète et l'orateur, mais n'oublions pas qu'il a été avant tout homme de bien, dans ses écrits comme dans ses actes. Sans doute, comme toutes les âmes poétiques, il aimait la gloire ; mais il aimait mieux encore le bien, la vertu, Dieu. Il aurait brûlé tous ses écrits et ses discours, s'il y avait vu une page, une ligne dangereuse pour la foi ou la morale. Aussi, on n'y trouve que des idées saines, des sentiments élevés, des enseignements salutaires, la glorification de ce qu'il y a de bon et de beau dans l'humanité.

Il aimait sa religion, sa nationalité. Il croyait à la vertu, au patriotisme, au dévouement, à tout ce qui fait la force de l'individu et de la nation ; et il mettait en pratique ce qu'il enseignait ; il croyait que celui qui prêche doit pratiquer. Il n'admettait pas la foi sans les œuvres.

Son patriotisme était intransigeant, mais éclairé. Profondément versé dans l'histoire de notre pays, connaissant tous les secrets de notre origine, il croyait fermement qu'une nationalité fondée au prix de sacrifices si sublimes, malgré les obstacles et les dangers les plus insurmontables, ne pouvait périr. L'un des sujets les plus loyaux et les plus dévoués à la couronne d'Angleterre, grand admirateur, avec raison, des institutions anglaises, il rendait à César ce qui appartient à César et à sa nationalité ce qu'il lui devait. Il avait foi dans l'avenir de sa race, et croyait, en travaillant à sa conservation, servir les vues de la Providence.

Il avait raison.

La variété et la diversité existent dans toutes les œuvres de la création, dans l'ordre social et intellectuel comme dans l'ordre physique. Elles manifestent la puissance de Dieu qui a créé l'harmonie au milieu de tous ces éléments de division et de confusion, et constituent un ensemble de beauté, de grandeur et de progrès. Chaque être, chaque famille contribuent à l'harmonie générale en se mouvant, comme les mondes célestes, dans le cercle spécial qui leur a été assigné, en conservant sa physionomie particulière, son caractère original. Vouloir les fusionner de manière à faire disparaître ce qui les caractérise serait jeter la perturbation dans l'ordre providentiel.

La même loi s'applique à la nationalité qui n'est que l'extension, le cercle agrandi de la famille ou l'union d'un plus ou moins grand nombre de familles ayant la même origine, la même langue, les mêmes souvenirs et des facultés intellectuelles et morales qui les distinguent des autres nations, et leur fait jouer un rôle spécial dans l'œuvre de la civilisation.

Tout est coordonné de manière à produire l'équilibre dans le monde moral comme dans l'ordre physique, pour que les êtres, les familles et les nations se complètent et concourent au but divin par la variété des moyens et des facultés.

On ne fusionne pas d'ailleurs des nationalités rendues à l'apogée de leur développement ; mais supposons qu'on pût réussir à faire des Anglais et des Français une seule nation parlant la même langue, ayant la même littérature, la même manière de penser et de sentir, que deviendraient toutes ces œuvres littéraires et artistiques, ces chefs-d'œuvre qui doivent leur beauté et leur grandeur aux traits d'esprit et de caractère distinctifs de ces deux grandes nations ? Et que resterait-il de l'histoire, si l'on en faisait disparaître les faits immortels enfantés par le sentiment national ?

Le temps peut bien modifier ces différences et ces distinctions, éteindre ou rétrécir le cercle des grandes agglomérations humaines, mais les anéantir, jamais. Ecoutez les cris de l'Alsace et de la Lorraine que le droit du plus fort a détachées du tronc maternel. C'est la voix de la nature qui parle. Pourquoi ces millions d'hommes sous les armes ? Pourquoi depuis vingt ans le spectacle de ces grandes nations qui s'épuisent et se ruinent à se préparer à la guerre la plus terrible que le monde aura vue ? Parce que le principe des nationalités a été violé, parce que la France ne désarmera pas avant d'avoir fait rentrer ses deux filles bien aimées dans la famille nationale.

Cantu, dans le vingt-quatrième volume de son *Histoire Universelle*, discute avec talent cette question vibrante des nationalités. Après avoir parlé des progrès que cette question a faits, il ajoute :

" La révolution de 1848 a substitué au principe de la légalité artificielle des traditions et du droit des gens celui de la nationalité, voulant que les territoires fussent distribués d'après ce principe et non d'après les conventions, que la fin suprême du droit des gens fût de garantir le respect et l'indépendance de chacune des nationalités...

" Chaque peuple est destiné à un office particulier, à mettre en lumière telle ou telle face de la vérité ou une portion de cette vérité en employant une littérature, une langue particulière, et de la sorte, chacun, par une voie qui lui est propre, arrive à cette grande fin du perfectionnement universel."

M. Rameau de Saint-Père, le sympathique auteur de plusieurs livres sur notre histoire et nos destinées, après avoir parcouru l'Amérique du Nord en tous sens et avoir étudié le caractère, les mœurs et les aptitudes des diverses nationalités qui l'habitent ; après avoir constaté le mouvement industriel et commercial qui entraîne tous les peuples de ce continent à la poursuite du progrès matériel, a résumé toutes ses pensées et ses réflexions en disant que l'élément français était appelé à jouer en Amérique un rôle analogue à celui qu'il joue en Europe, à y représenter surtout le côté artistique et littéraire, à faire résonner la note poétique au milieu du bruit prosaïque des usines et des machines à vapeur.

Pourquoi pas ?

Si notre littérature à son berceau a pu produire des Garneau, des Crémazie, des Chauveau et autres écrivains remarquables, que ne pouvons-nous pas espérer pour l'avenir, alors que le talent pourra vivre du produit de ses œuvres et donner toute sa mesure !

Donc, Messieurs, il faut tenir compte de ce qu'il y a de bon, d'utile et de providentiel dans l'existence conjointe et la conservation sur ce continent du caractère national des deux grandes races dont les œuvres ont fait la grandeur de l'Europe, et l'on doit respecter l'opinion de ceux qui par principe autant que par sentiment travaillent à cette œuvre de conservation.

Donc, Messieurs, j'avais raison de dire en commençant que la vie de M. Chauveau était pleine de grands enseignements, et que son influence sur notre société avait été bonne, utile et salutaire. Aussi, il me semble que je ne puis mieux terminer qu'en lui adressant les paroles mémorables qu'il prononçait sur la tombe de son ami Garneau :

" Adieu et merci ! Merci des beaux sentiments que vous avez fait germer dans nos âmes ; merci du bien que vous avez fait à notre jeunesse ; merci de vos grands, de vos sublimes exemples ! Adieu au nom de votre pays. Jouissez en paix, jouissez de votre double immortalité. Dans ces grandes destinées qui s'ouvrent devant lui, le Canada ne vous oubliera pas ; les peuples rivaux qui nous entourent apprendront dans vos œuvres à aimer nos ancêtres ; ils réclameront leur part de notre glorieux héritage."

V — *Réponse à M. David,*

Par M. LOUIS FRÉCHETTE.

(Lue le 29 mai 1891.)

Monsieur et cher collègue, — C'est à moi, votre confrère au barreau et dans le journalisme, à moi votre compagnon d'armes dans les luttes politiques du passé, à moi votre fidèle ami de trente ans, qu'incombe ce soir la tâche bien agréable — mais un peu difficile — de répondre au discours que vous venez de prononcer, tout en vous souhaitant la bienvenue dans une société où vous auriez dû siéger depuis longtemps.

Permettez-moi, tout d'abord, d'insister un peu sur ce point ; car notre Académie tient à honneur de ne pas assumer devant le public la responsabilité de vous avoir trop ménagé ses suffrages, quand votre présence s'imposait par tant de titres dans un corps qui a l'ambition de représenter l'élite des travailleurs de la pensée dans ce pays.

Quand notre premier patron, M. le marquis de Lorne, fit — plus ou moins à l'impromptu, comme tout le monde le sait — le choix de ceux qui devaient être les membres fondateurs de la future société, vous aviez à peu près brisé votre plume de publiciste pour vous livrer exclusivement à l'exercice d'une profession plus lucrative et non moins absorbante.

La bénédiction de Jacob s'était répandue sur votre foyer dans sa formule la plus gracieuse, mais aussi avec une abondance qui, en même temps qu'elle faisait de vous le père le plus radieusement entouré, n'a pas peu contribué à parfaire en vous le type du patriote accompli, payant de sa personne et prêchant d'exemple.

Vous crûtes que tout retour vers les amours passés — vers la muse, comme on disait autrefois — en vous distrayant de la pensée quotidienne, pouvait dérober à votre famille une parcelle de son droit légitime si votre travail tout entier, et trop conscient de votre valeur pour consentir à briller au second rang nulle part, vous avez jusqu'ici résisté aux instances que nous avons faites pour vous engager à laisser porter votre nom sur la liste de nos candidats.

Une perte, douloureuse et pour notre société et pour le pays, a rendu — à quelque chose malheur est bon — ces instances plus pressantes ; et nous avons la satisfaction de voir disparaître aujourd'hui de nos rangs une lacune que nous déplorions tous, et que les amis des lettres canadiennes avaient peine à s'expliquer.

Donc, vous avez été appelé, mon cher confrère — et cela par le vote unanime de tous les membres de notre société — à prendre le fauteuil si noblement occupé jusqu'ici par feu M. Chauveau.

Il était difficile qu'il en fût autrement. La nature de vos œuvres, le cachet de votre talent, et en particulier votre foi sans borne dans tout ce qui constitue les traditions les plus précieuses de notre race, ce patriotisme en un mot si inaltérable et si désintéressé

qui a toujours donné tant de relief à votre caractère d'homme public, tout vous indiquait énergiquement à nous, comme le successeur naturel de cet écrivain patriote dont vous venez de faire un si juste en même temps qu'un si brillant panégyrique.

Mais ce n'est pas tout. Vous l'avez dit mieux que je ne saurais le répéter, M. Chauveau fut le pionnier le plus actif et le plus autorisé qui soit entré la plume à la main dans le domaine encore vierge des lettres canadiennes. On peut donc le considérer à juste titre comme un des pères de notre littérature.

Et vous aussi, mon cher collègue, vous êtes un des pères de notre littérature. Si vous ne l'êtes pas suivant le temps et selon la chair — qu'on me passe cette expression bizarre — vous avez été, et la reconnaissance d'un bon nombre de ceux qui vous entourent en ce moment ne l'a pas oublié, vous avez été, dis-je, le premier de ses pères nourriciers.

Oui, monsieur David — et ce n'est pas là le moins précieux des fleurons qui brillent à votre couronne littéraire — le premier dollar qui soit tombé dans l'escarcelle d'un poète ou d'un prosateur canadien, en rémunération de ses efforts et de son talent, est sorti de la caisse de l'*Opinion Publique*, journal dont vous étiez l'un des fondateurs, le rédacteur et l'âme. La part d'honneur qui revient à M. George Desbarrats, dans cette innovation, ne diminue en rien le titre que la vôtre vous donne à notre gratitude.

Ce fut alors un grand scandale dans le camp des imprimeurs, des libraires, des éditeurs, des propriétaires de revues et autres marchands des pensées d'autrui, qui croyaient déjà faire des miracles de désintéressement en daignant accepter, sans se faire payer, les travaux de nos écrivains, forcés de publier chez eux.

" Quel mauvais exemple ! s'écriait-on ; vous verrez que ces messieurs de la plume, encouragés par un pareil abus, finiront par vouloir se faire payer comme les autres pour travailler. Et nous, les éditeurs, nous serons forcés — comme les autres aussi — à ne plus nous enrichir qu'à nos propres frais ! Est-ce tolérable ? "

Or ces messieurs avaient raison. Vous donniez là, mon cher monsieur David, un très mauvais exemple. Et comme les mauvais exemples sont généralement suivis, voyez ce qui est advenu depuis !

Je connais des journalistes qui se sont enrichis comme de vulgaires courtiers, des prosateurs qui se font payer leurs chroniques, tout comme si c'était de la moutarde ou du sené, des écrivains qui vendent leurs livres à leur propre bénéfice, comme de simples fabricants de cigares, et — chose plus étourdissante encore — des poètes qui, au mépris de toutes les traditions, amassent leur pécule, comme le premier épicier venu, et qui, suivant l'expression audacieuse de l'un d'eux, " aspirent à l'honneur d'être marguilliers ". Vous admettrez avec moi que c'est le monde renversé. Une révolution ni plus ni moins.

Voilà comment, avec la nature la plus douce, le tempérament le plus paisible, les sentiments les plus chrétiens, on peut devenir un révolutionnaire.

Au surplus est-il bon de ne pas oublier qu'il peut y avoir des révolutionnaires non seulement fort excusables, mais encore dignes d'éloges et d'admiration. Vous l'avez surtout prouvé, Monsieur, par votre beau livre : *Les Patriotes de* 1837 *et* 1838.

Vous avez démontré dans cet ouvrage, précieux pour nous à plus d'un titre, que les sacrifices politiques et le dévouement aux grandes causes — quels que soient le châtiment dont on les punisse ou l'appellation dont on essaie de les flétrir — finissent toujours par reprendre leur vrai nom et revêtir leur caractère véritable.

Vous avez surtout démontré, par l'éloquence des faits, par le témoignage de l'histoire

— chose qu'on n'étudie pas assez, par malheur — que les exécutions prétendues infâmantes, pour cause de résistance au pouvoir, sont aussi répréhensibles au point de vue social qu'au point de vue chrétien ; et que, la plupart du temps, quand elles ne sont point des crimes, ces sévérités inutiles sont toujours des fautes, — ce qui en politique est souvent beaucoup plus grave.

Qu'y a-t-il au fond dans la peine de mort ? Une vengeance ? Ce serait bien lâche ?

Non ! tout ce qu'il peut y avoir d'excusable dans ce fait : la société aux prises avec un seul homme, et l'écrasant, c'est la nécessité. Et la nécessité, dans ce cas, s'appelle l'exemple.

Or, où est l'exemple, quand vous savez que, dans vingt, trente ou quarante ans, le cadavre de ce supplicié reposera sous un monument élevé par la reconnaissance ou la sympathie de ses compatriotes ?

Où est l'exemple, quand on sait que la postérité transformera cet échafaud en piédestal, que ce nom aujourd'hui accueilli par des huées, soulèvera des acclamations dans les fêtes patriotiques de l'avenir, et que ce front, vainement stigmatisé de notre temps ceindra plus tard l'auréole des grands persécutés ?

En 1838 et 1839, le fanatisme affublé du manteau de la justice a ignominieusement traîné à la potence Cardinal, De Lorimier, Duquet, Hindelang... En ont-ils été déshonorés ? Non ! où est l'exemple, alors ?

On leur a fait subir le châtiment des meurtriers. A-t-on réussi à les avilir ?... Mais je voudrais savoir s'il existe parmi leurs compatriotes un seul homme qui rougirait d'être le fils de l'un d'eux !

Où est l'exemple ? je le répète.

On a donné, il n'y a pas longtemps, le nom de De Lorimier à l'une des rues de la ville qui a vu son supplice. Qui en a été surpris ? Personne. Où est donc l'exemple ?

Allons plus loin. D'autres que ces victimes de l'arbitraire et des rancunes inavouables ont combattu pour la même cause. Bon nombre d'entre eux sont même morts glorieusement sur le champ de bataille. A quelques exceptions près, leur masse est oubliée, tandis que le supplice prétendu infâmant a rendu les autres immortels.

Où est l'exemple, encore une fois ?

Ah ! c'est en politique surtout que ce vers du poète est vrai :

Le crime fait la honte et non pas l'échafaud.

J'ajouterai que là où il n'y a pas déshonneur, il ne peut pas y avoir crime. Et quand on applique le châtiment des criminels, là où il n'y a pas de crime, la honte retombe sur ceux qui ont prononcé la sentence ; et le souvenir de leurs victimes, quand arrive le moment des justes rétributions, bien loin d'inspirer la terreur désirée, provoque infailliblement des imitateurs. Donc, exemple nul : par conséquent lâcheté. Résultat faux : par conséquent sottise et ineptie !

Votre livre, mon cher collègue, est le développement de cette thèse. En l'écrivant, vous avez fait plus que l'œuvre d'un historien consciencieux et disert, vous avez fait un ouvrage de haute morale politique, un ouvrage essentiellement civilisateur. La présente génération vous en remercie par ma voix ; l'avenir, pour la même raison, vous bénira par la voix de nos enfants.

Un journal a dit que vous aviez réhabilité les Patriotes de 1837. Je ne suis pas de

cet avis. La réhabilitation s'était opérée depuis longtemps dans le cœur des masses. Elle a été l'œuvre spontanée de l'esprit public, du sentiment de justice inné chez tous les peuples, de la conscience nationale tout entière.

N'avait-on pas vu déjà, même les alliés politiques des persécuteurs de l'époque, invoquer la mémoire de ces martyrs et se réclamer de leur patriotisme ? N'avait-on pas entendu, dès 1849, un député anglais, ancien bureaucrate et volontaire de Colborne, déclarer en plein parlement que dans le sang de ces révoltés avaient germé nos libertés constitutionnelles ?

Non, vous n'avez pas réhabilité les Patriotes de 1837, monsieur David ; mais vous avez rendu leurs noms impérissables dans le souvenir du peuple, en vulgarisant leurs hautes figures, en jetant un lumineux reflet sur leur pensée et leur œuvre, en un mot, en les montrant tels qu'ils doivent être jugés par la postérité : c'est-à-dire comme une poignée de braves qui ont dit un jour à l'oligarchie anglaise : — " Halte-là ! nous voulons être de loyaux sujets, mais nous ne serons jamais des ilotes ! " et qui l'ont dit avec assez d'énergie pour être entendus de l'autre côté des mers, et obtenir pour eux et leurs enfants la somme de liberté légitime à laquelle a droit tout peuple intelligent qui se respecte.

On a pu différer d'opinion avec eux dans le temps ; mais, grâce en partie à votre éloquent plaidoyer, il n'est plus permis, aux citoyens de cœur que le fanatisme n'aveugle point, de refuser à ces bienfaiteurs publics l'hommage de leur admiration et de leur reconnaissance.

Votre prédécesseur dans la société où vous venez de prendre place n'a jamais eu d'autre manière de voir. Il est vrai que, chez lui, l'homme public — chaque position a ses exigences particulières — restreignit jusqu'à un certain point les coudées franches de l'homme de lettres.

Souvent on s'aperçoit que des attaches de parti lui imposent certains ménagements, prescrivent certaines limites à la hardiesse de sa plume. Tranchons le mot, on sent qu'il n'exprime pas toujours sa pensée tout entière.

Mais si l'on réfléchit qu'il nous a précédés d'une génération, et si l'on songe au degré d'indépendance que les idées ont conquises durant les dernières décades, on ne peut s'empêcher de conclure que M. Chauveau ne cessa jamais un instant d'appartenir à la phalange des patriotes dont vous avez célébré le noble caractère.

On le voit assez, du reste, dans la conclusion si simple, mais en même temps si significative de son *Charles Guérin*, qui fut, si je ne me trompe, le premier roman canadien par ordre de date, et qui — s'il ne mérite pas tout le bien qu'en pensait l'auteur — ne mérite certainement pas non plus le mal qu'on en a dit.

C'est peut-être le moment, mon cher collègue, de faire ressortir ici la constante harmonie qui a toujours existé entre vos actes publics et vos écrits. Car il ne suffit pas d'être un écrivain élégant et érudit pour avoir droit aux grands suffrages, il faut surtout que cet écrivain soit honnête homme, — c'est-à-dire qu'il y ait union logique et constante entre ses actions et ses paroles.

Or c'est peut-être là ce que vos compatriotes admirent le plus en vous.

En effet, que vous preniez en main la cause des orphelins confiés à son pays par un patriote mourant pour ses convictions ; que vous assumiez sur vos épaules la lourde charge d'élever un édifice national pour les besoins de nos sociétés littéraires, scientifiques

ou patriotiques ; que vous preniez place dans un fauteuil de journaliste pour défendre un parti, ou que vous vous leviez en parlement pour proposer une loi dans les intérêts d'une classe ou d'une cause ; toujours une même pensée se dégage de toutes vos déterminations ; toujours une même idée inspiratrice semble planer sur votre sphère d'actions quotidiennes : c'est la pensée patriotique, c'est l'idée du progrès national servi par l'homogénéité de notre race.

Mais la démonstration de ce trait, chez vous si caractéristique, m'entraînerait trop loin. Avec cela qu'il me faudrait peut-être faire certaines restrictions dans mes éloges ; car je suis souvent porté à vous accuser d'aller trop loin vous-même dans votre opiniâtreté à servir la cause populaire.

Comme les collectivités n'ont point d'entrailles, le peuple est égoïste ; et comme il n'est pas habitué aux grands dévouements, il ne se les explique pas ; partant il les suspecte et les méconnaît. De là son ingratitude proverbiale. Le désintéressement lui inspire de vagues soupçons, tant il lui semble peu naturel. Il préfère se jeter à la tête des hommes qui l'exploitent, pour la simple raison qu'il les comprend mieux.

Vous avez eu l'expérience de ces choses, mon cher collègue ; moi aussi. Cela fait partie de la somme des connaissances utiles que l'on n'acquiert jamais qu'à ses propres dépens.

Ce développement anormal d'une grande qualité, je le retrouve — permettez-moi de vous en faire le reproche amical — à certaines pages de vos *Biographies.*

Dans votre généreux zèle à préconiser les nôtres, dans votre désir d'exalter autant que possible nos figures historiques, vous avez, par la magie de votre style, placé sur le même piedestal des hommes qui, s'ils en ont connaissance, doivent être bien étonnés de s'y rencontrer. Cela me semble d'autant plus dangereux que le lecteur est, en voyant le tableau, captivé par la grâce des contours autant que par la variété du coloris.

Vous avez fait là un livre délicieux à feuilleter ; mais en enseignant ainsi — simplement parce qu'ils sont des nôtres — à respecter outre mesure des hommes qui ont méconnu ou méprisé votre dogme, ne vous exposez-vous pas à ébranler vous-même ce dogme, et à manquer votre but, qui est de stimuler chez nous la fierté de la race ? C'est à y réfléchir.

Je risquerai une autre remarque qui vous surprendra peut-être ; mais je connais trop les coudées franches que vos convictions accordent à la sincérité d'autrui pour supposer un instant que cette remarque puisse provoquer votre indignation.

En écoutant votre discours de tout à l'heure, dans lequel, fidèle à vos inébranlables idées de nationalité, vous cherchez à démontrer que nos plus chers espoirs d'avenir doivent reposer sur elles, j'avais peine, malgré mon désir, à identifier, dans mon intérieur, mes prévisions avec toutes les vôtres.

Comme tout le monde, j'admire en vous cette logique qui prend ses prémisses dans le cœur et impose ses conclusions à l'intelligence ; mais son application, que vous poursuivez avec tant de persévérance et — il faut le dire — avec tant de succès, se présente souvent à mes yeux sous la forme d'un problème assez troublant.

Certes, je suis trop français pour ne pas sentir comme vous sur ces questions ; et j'ai trop lu et fréquenté les poètes pour ne pas aimer à voyager dans les pays bleus de l'idéal ; mais, au risque de heurter un peu chez vous la tige où fleurissent les belles illusions, je vous avouerai qu'il me vient parfois certains scrupules, ou plutôt certaines hésitations dont je me risque à vous faire part.

Au plus fort de mes aspirations patriotiques, souvent il m'arrive de me demander tout à coup si je vois bien juste, s'il est bien vrai qu'il soit si bon de s'incliner avec cette dévotion persévérante devant les dieux du passé. Notre amour filial pour le vieux drapeau ne nous fait-il pas oublier un peu trop que les choses de ce monde n'ont guère de caractère permanent ? que ce qui était vrai hier peut ne pas l'être aujourd'hui, et que ce qui l'est aujourd'hui ne le sera peut-être pas demain ?

Notre génie national, notre cachet national, d'où viennent-ils ? de quelle époque datent-ils ? Ne subiront-ils pas fatalement dans l'avenir les fluctuations, les transformations, les évolutions qu'ils ont subies dans le passé ? Car, il faut bien l'admettre, ce que nous appelons le caractère distinctif de notre nationalité — comme celui de toutes les autres nationalités, du reste — n'a été et n'est encore que la synthèse fortuite, ou providentielle, si vous aimez mieux, imposée par des événements et des choses contre lesquels les patriotismes du temps ont héroïquement combattu.

Songeons aux conquêtes romaines ; songeons aux invasions des Francs ; songeons aux révoltes sanglantes de l'Aquitaine ! Ecrasement au nord, au sud, à droite et à gauche, voilà ce qui a créé la France ; et c'est du choc et du mélange des vainqueurs et des vaincus qu'est résulté ce que nous appelons aujourd'hui notre caractère national.

Les siècles mêmes n'ont pu cicatriser toutes les blessures. Il existe encore certains villages perdus dans les landes de Bretagne où la haine du *Gallo* — c'est-à-dire du Français — se perpétue encore de nos jours, enseignée aux enfants dans la langue du terroir, en même temps que les traditions sacrées de l'indépendance perdue.

Cela est beau, cela est touchant, cela vous attendrit à vous mettre des larmes dans les yeux ; mais, pour me servir d'une expression que la poésie peut négliger, mais qui entre de force dans les calculs de l'esprit moderne, cela est-il bien pratique ?...

Tenez, lorsque, comme vous, j'embouche le clairon de la nationalité avant tout, je ne puis me défendre de songer que le grand rayonnement de la gloire française, que ce splendide édifice national qu'on ne peut entamer sans ébranler le monde, que ce drapeau dont les envollements épiques ont survécu aux plus fameux désastres de l'histoire, tout cela est né dans la cendre des petits patriotismes éteints.

Parlons maintenant de notre langue ; cette langue française, si belle, si claire, si harmonieuse, ce joyau si cher de notre héritage, qu'était-elle il y a quatre cents ans ? Et du train où vont les choses à Paris, que sera-t-elle dans cent ans ?

Je ne parle pas de notre français, à nous Canadiens, car si la plupart de nos professeurs, de nos avocats, de nos journalistes et de nos hommes d'Etat persistent à ne pas vouloir écouter ceux qui essaient de les corriger, la langue que nos enfants parleront dans cinquante ans ne ressemblera guère à ce qui s'appelle aujourd'hui ou à ce qui s'appellera alors la langue française.

Il est vrai que nous nous targuons d'avoir conservé intacte la langue du grand siècle ; mais cette prétention à l'immobilité ou plutôt à l'impassibilité n'empêchera pas la langue française, comme toutes les autres langues, de se transformer avec le temps ici comme ailleurs.

En France, on ne sait si l'évolution se fera pour le mieux ; mais ici ce sera certainement pour le pire, puisque, paraît-il, nous sommes à l'apogée de la perfection.

En tout cas, ce que je veux dire, c'est que la langue, pas plus que le génie d'une race, n'a de caractère permanent, et que nous aurons beau tenir à notre langue comme à nos

yeux, si celui qui parmi nous possède le mieux sa langue française — vous, par exemple, mon cher confrère, — s'endormait aujourd'hui pour se réveiller dans quelques siècles, il ne serait certainement pas compris par ceux qui parleront le français dans ces temps futurs.

Il resterait donc à savoir s'il est plus patriotique de chercher à maintenir dans son intégrité la langue que nous parlons aujourd'hui, ou de travailler à suivre le courant que la force des choses imprime à la langue française en Europe. Nous avons à choisir entre ne plus parler notre langue d'aujourd'hui, ou parler une autre langue que la France. Vers quelle alternative nous tourner ?

Et quant aux nationalités elles-mêmes, mon Dieu, lorsqu'on réfléchit qu'elles ne sont après tout que la conséquence des obstacles physiques qui, en séparant les différents groupes d'hommes, et en créant entre eux des intérêts divers, ont engendré et engendrent encore les conflits qui, à certaines périodes, ensanglantent l'humanité, n'est-il pas permis, en face des progrès scientifiques qui suppriment chaque jour ces barrières entre les peuples, de se demander si c'est bien entrer dans les vues de la Providence que de faire tant d'efforts pour perpétuer un état de choses qui a produit tant de malheurs dans le passé, et qui doit fatalement disparaître quand même ?

Quelques-uns disent : s'il n'y avait jamais eu de Français ni d'Anglais, où seraient les chefs-d'œuvre enfantés par ces deux races ?

On pourrait leur répondre : Mais s'il n'y avait jamais eu ni Anglais ni Français, il est à supposer qu'il y aurait eu quelque chose à la place ; et dans cette hypothèse, ce quelque chose n'aurait pu être qu'un peuple ayant hérité en bloc de la somme de génie échue aux deux nations, et par conséquent capable de produire des chefs-d'œuvre même vraisemblablement supérieurs aux productions respectives des deux races isolées.

Mais j'irai plus loin. J'admettrai pour un instant votre théorie : à savoir, que deux peuples distincts, à cause de leurs tempéraments divers, peuvent produire des œuvres sinon plus puissantes ni plus nombreuses, du moins plus variées que si ces deux peuples n'en formaient qu'un. Et je vous dirai : Quand cela serait ?

Sans feuilleter inutilement les pages de l'histoire, rappelons-nous seulement ce qui s'est passé en France, il y a vingt ans ; regardons aussi de chaque côté du Rhin ces deux puissantes nations qui n'attendent qu'un signal pour mettre le feu aux quatre coins de l'Europe ; songeons en plus aux conséquences qu'entraîne avec elle cette paix armée, tellement ruineuse pour tous qu'elle fait presque désirer une guerre d'extermination pour y mettre fin.

Puis je vous demanderai si ce n'est pas là payer un peu cher l'avantage d'avoir, en littérature et en art, des produits de l'école française et des produits de l'école allemande, au lieu d'avoir de l'art et de la littérature tout simplement !

Encore une fois, mon cher collègue, je ne soutiens pas une thèse — on pourrait la confondre avec un plaidoyer *equal rightist* ; je pose simplement des problèmes. Et je vous avouerai, aussi encore une fois, que, tout en partageant la plupart de vos opinions relativement à notre avenir national, je ne laisse pas de me trouver assez perplexe en face de ces problèmes.

Tout cela nécessiterait sans doute de longs développements qu'il serait absurde d'aborder dans un simple discours académique ; mais celui qui écrira un livre sérieux sur le rôle des nationalités dans le passé et dans l'avenir aura à traiter de choses bien complexes, et jettera peut-être le doute et le désarroi dans bien des esprits.

En attendant, devons-nous suivre la voie tracée par le sentiment, ou devons-nous au contraire prendre pour guide une philosophie froide et positive ? C'est là la question du moment.

Vous avez, mon cher collègue, opté pour la philosophie du cœur ; loin de vous en blâmer, j'emboîte le pas et suis votre exemple. Si les nationalités doivent disparaître comme individualités ; s'il entre dans les vues de la Providence que l'humanité ne forme un jour qu'une grande famille ayant les mêmes aspirations et le même langage, eh bien laissons aux poètes de l'avenir la tâche de chanter l'embrassement universel ; et d'ici là prenons le monde tel que Dieu nous l'a fait, tel que nos pères nous l'ont laissé, et tirons en le meilleur parti possible sans entraver la marche du progrès.

Du reste, il ne faut pas oublier que les choses du cœur ont leur sublimité, et que l'enthousiasme, même irréfléchi, a inspiré plus de dévouements dans le monde, produit de plus grandes actions, créé plus de héros que tous les calculs des théoriciens les plus transcendants.

En tout cas, le plus clair de tout ceci, mon cher monsieur David, c'est que, à titre de successeur de notre regretté collègue, M. Chauveau, qui fut patriote, poète, orateur, historien, premier ministre, président du sénat, et président de la Société Royale, vous êtes appelé à prendre place au premier fauteuil de notre académie nationale.

Dois-je vous féliciter d'être devenu l'un des nôtres ? A mon avis les félicitations peuvent être mutuelles. La Société Royale est un corps qui a sa valeur et son prestige ; mais cette valeur et ce prestige ne sauraient être que le reflet de l'éclat qui s'attache au nom et à la réputation de chacun de ses membres.

Sous ce rapport, mon cher collègue, notre société n'hésite pas à reconnaître, par ma voix, la dette qu'elle contracte ce soir envers vous.

VI — *Le Laboureur Canadien d'autrefois,*

Par le RÉVÉREND THÉODORE LAFLEUR.

(Présenté par M. Lusignan, le 28 mai 1891.)

Disons qu'il y a de cela de cinquante à cent ans passés. A cette époque, les terres si neuves du Bas-Canada étaient, sans engrais, d'une étonnante fertilité. On en labourait presque toute la surface défrichée chaque année, car on n'y laissait en prairie que tout juste ce qu'il fallait pour avoir le foin suffisant à la consommation locale, qui était peu considérable, attendu qu'il n'y avait pas encore de grandes villes dans le pays, et qu'il ne se faisait point d'exportation de fourrage.

Il en était tout autrement pour les grains, particulièrement pour le blé, qu'on exportait en énormes quantités, en Europe surtout.

Il est des gens autour de nous qui se souviennent d'avoir vu les hangars de Laprairie regorger de beau froment canadien, au grain jaune et plein, attendant là la flottille du printemps. Celle-ci était belle à voir, même dans notre port de Montréal sans quais apparents, avec ses nombreuses voiles sans fumée et sans noirceur de charbon, comme aujourd'hui. On n'avait pas alors ces énormes vapeurs où viennent s'engouffrer les millions de boisseaux de l'Ouest, sans qu'il y paraisse à peine.

Le Bas-Canada était alors un des greniers de l'Europe. Mais à quel prix, je vais essayer de le faire comprendre.

Avant de pouvoir labourer, le colon canadien a dû commencer par défricher, et comme il l'exprime lui-même : faire de la terre neuve ; c'est-à-dire en dépouiller la surface des vieilles croissances, des forêts de haute futaie, de vieux débris de bois et de pierres accumulés, pour exposer le sein fécond de la terre aux rayons du soleil.

Vous êtes-vous bien rendu compte de l'héroïsme de ce petit être — dans un rêve de bonheur peut-être — qui d'abord *pour* se faire une éclaircie *pour* sa cabane, et se pourvoir de troncs d'arbres *pour* la construire, s'approche avec sa hache du premier géant de la forêt *pour* l'abattre ! Ce n'est pas un seul Goliath qu'il faut abattre, ce sont des centaines, des milliers, et cela durant de longues années. Ne soyez donc point trop sévère pour ce pauvre nain épuisé de fatigue, éreinté, affamé parfois, quand il appelle à son secours le mystérieux et brillant ami — le feu — qui l'a tenu au chaud quand tout craquait de froid au dehors, qui a fait bouillir son pauvre potage et en a dégagé toute la bonne odeur dont il est susceptible. Ah ! il trouvera peut-être bien, lui aussi, que son bienfaisant ami est trop ardent, qu'une fois en train il va trop loin, il brûle trop, il détruit trop, mais il n'y peut rien ; il faut qu'il laisse faire ; il en tirera son profit ; il sèmera sur la cendre. Quelle riche moisson va sortir de là ! Comment voulez-vous que cela ne le console pas un peu ? Une grande partie du sol canadien a été ainsi défriché.

Lorsque cela a été fait en grand dans le pays, la routine régulière de la ferme a commencé. Supposons qu'avec des expressions de joie et des chants de triomphe, comme dit l'Ecriture Sainte — car c'est après un long combat qu'on a obtenu ce résultat — une abondante récolte soit en grange et en cave comme grains et comme légumes — car il y a peu de fruit et point de vin — le cultivateur va commencer ses labours d'automne, de beaucoup les plus considérables. Il fallait s'y prendre de bonne heure, car on en avait pour longtemps. Celui qui aujourd'hui, dans une promenade d'automne parcourrait les guérets de notre province, ne pourrait se faire qu'une faible idée de ce qu'était alors ce travail. Au lieu d'y voir un homme marcher d'un pas presque rapide derrière une leste charrue bien découplée, tirée par deux chevaux que cela n'a pas l'air de fatiguer, il aurait vu deux hommes très occupés autour d'un attelage d'au moins quatre bêtes, souvent de six, traînant une lourde machine, en bois surtout, mais agrémentée de différentes pièces de ferraille plus ou moins bruyante. Ce grossier ensemble qu'on nommait une charrue avait d'abord deux mancherons en bois presque droit, un tout petit bout de soc en fer à l'extrémité d'une énorme oreille en bois sur laquelle étaient appliquées des lames de fer en forme de côtes devenues luisantes par le frottement incessant de la terre déchirée. Sur le haut de cette oreille reposait le gros bout d'une forte et longue perche enclavée entre le bas des mancherons, et portant à quelques pouces de là le coutre tranchant. L'autre bout, percé de plusieurs trous, reposait sur une paire de petites roues avec sommier, qu'on nommait *rouelles*. On allongeait ou racourcissait cette perche selon que l'on voulait faire mordre le soc plus ou moins profondément dans le sol souvent lourd et glaiseux, mais riche.

Ces six bêtes, dont quatre bœufs et deux chevaux, n'étaient pas toujours faciles à conduire ; aussi fallait-il parfois un homme et un garçon supplémentaire pour diriger, stimuler, aiguillonner l'avant-train. Dans ces premiers attelages on assujétissait le joug des bœufs avec des lanières de cuir aux cornes de ces bêtes. Cela leur faisait plier le cou en arrière, relever le bas de la tête par un effort contre nature, et ressortir les yeux d'une façon pénible à voir et qui indiquait la souffrance. Le joug plus moderne qu'on y substitue avec son collier en bois est un progrès sur l'autre, quoique paraissant encore bien raide et très dur sur les épaules osseuses en mouvement de droite et de gauche, laissant s'alonger un cou qui a l'air de vouloir sortir du corps. Avec leurs nasaux fumants et leurs corps aussi, excepté par les jours froids d'automne, ces bêtes marchaient lentement, péniblement, l'une dans la raie boueuse, l'autre plus élevée de quelques pouces sur la bande de terre que la charrue retournait derrière elle. Pour se maintenir dans leur position, ces lourdes bêtes se pressaient l'une contre l'autre les jambes de devant en arc-boutant, épaule contre épaule, dans un double effort de position et de progrès, leurs pieds fendus s'enfonçant pesamment dans la terre molle. Assortir convenablement ces bêtes pour les faire marcher et tirer à l'unisson afin de tracer un sillon droit et uniforme était une affaire compliquée et difficile, malgré son apparente simplicité.

Il y avait bien là deux chevaux dont la principale fonction était de diriger la marche, bien plus que de prendre leur quote part de la lourde charge ; mais le plus souvent ils se bornaient à piétiner un peu en avant. Ils étaient souvent impatientés de la lenteur de la marche, parfois donnaient un coup de collier par irritation, puis reculaient parce que le train n'avançait pas à leur gré ; si bien que le toucheur devait à la fois retenir l'ardeur de l'avant-train et aiguillonner celui de l'arrière.

Il avait pour cela recours à l'un des quatre instruments dont il était pourvu pour l'un des modestes, mais sérieux combats de la vie ; les guides ou *cordeaux* pour les chevaux, le fouet pour tous à l'occasion, l'aiguillon au gros bout du manche du fouet pour les bœufs récalcitrants, trop paresseux ou vicieux ; et enfin la voix mâle dont l'avait pourvu la nature. C'était l'instrument dont il faisait l'usage le plus fréquent, le plus immodéré. On l'entendait presque incessamment, cet aiguillon qui ne pique que l'oreille, mais qui devient si agaçant que même les pauvres bêtes en devaient être ahuries.

Au reste ce n'était pas seulement d'une manière générale que cette voix se faisait entendre pour stimuler l'entrain de tout l'attelage, mais souvent encore nominalement à l'animal qui n'était pas en harmonie d'effort avec les autres. Outre les cris de : hue ! dia ! allons ! un coup de langue qui s'adressait à tous, il y en avait pour *Caille*, *Noireaud*, *Barré*, *Gaillard*. Et toujours ainsi du matin au soir ; tant et si bien que cette voix humaine, la plus divine chose ici-bas après le sentiment et la pensée, quand arrivait le soir était toute enrouée, éraillée, à peine digne d'être entendue des bêtes.

Quand l'atmosphère était imprégnée d'une humidité invisible qui la rendait sonore au loin, on entendait ces voix de plusieurs fermes environnantes ; et bien que ce concert eût quelque chose de monotone, il n'en trouvait pas moins le chemin du cœur pour le remuer étrangement comme un écho lointain du triste chant de l'humanité, qui sur la terre entière mange son pain à la sueur de son front ou de son cerveau. Tirer un sillon tout droit était encore assez facile, mais quand l'attelage arrivait au bout de la pièce, que l'on faisait à cause de cela la plus longue possible, tourner de court tout cet attirail, que le langage canadien nomme aussi *drigail*, pour reprendre un autre sillon, c'était une manœuvre qui valait presque un carguement de voiles sur un trois-mâts à la veille d'une tempête, ou une volte-face d'artillerie sur un champ de bataille. Double paire de traits ou de chaînes, long timon entre la première paire de bœufs, rouelles et charrue, qu'une force herculéenne seule pouvait tourner à point pour reprendre le sillon voulu, puis l'on recommençait à enlever le ruban de terre pour le coller à son voisin ; et de même toute la journée, toute la semaine, durant un mois entier, coupé seulement des dimanches et du profond sommeil de chaque nuit. Le sommeil du laboureur est doux parce que sa fatigue le rend si profond.

Beaucoup de belles dames et de beaux messieurs ne se doutent guère, en mangeant leur beau pain blanc, tout ce qu'a coûté de rude labeur pour hommes et pour bêtes ces myriades de petits grains de blé qu'il a fallu faire pousser pour avoir ce pain-là. Eh bien, ce laboureur lui-même, avec un cerveau plus ou moins intelligent, peu cultivé, parfois tourmenté de pensées angoissantes, savait-il, alors qu'il déchirait ce sol, en y laissant tomber ses sueurs et parfois une larme, qu'il avait été précédé dans ce grand travail par un simple ver, sans cerveau peut être, mais qui depuis des centaines de siècles a labouré ce sol, formé de savants assolements, et a plus travaillé que l'humanité tout entière, dit Darwin, à rendre la surface de la terre propre à la culture ? Cependant ce pauvre ver de terre, ce grand travailleur, le soc de la charrue humaine le déchire sans pitié !

Le laboureur qui sait cela, qui a reçu à l'école de son village quelque notion de sphère et d'astronomie, qui sait qu'il laboure une petite pièce d'un globe immense qui tourne dans l'infini de l'espace, peut en dételant ses bêtes s'arrêter pour contempler un beau coucher de soleil, et avant de rentrer sous son humble toit lever les yeux vers la voûte étoilée pour y chercher Dieu par la pensée et par le sentiment. Ce laboureur peut avoir

quelque poésie dans l'âme, mais malgré les beaux vers de Lamartine, il nous semble qu'il y en a peu dans son métier :

La terre qui se fend sous le soc qu'elle aiguise,
En monceaux palpitants s'amoncelle et se brise....
L'homme la foule aux pieds, et secouant le manche,
Enfonce plus avant le glaive qui les tranche ;
Le timon plonge et tremble, et déchire ses doigts :
La femme parle aux bœufs du geste et de la voix,
Les animaux courbés sur leur jarret qui plie,
Pèsent de tout leur front sur le joug qui les lie....
Un moment suspendu, les voilà qui reprennent
Un sillon parallèle, et sans fin vont et viennent
D'un bout du champ à l'autre, ainsi qu'un tisserand
Dont la main tout le jour sur son métier courant
Jette et retire à soi le lin qui se dévide
Et joint le fil au fil sur la trame rapide.

C'est bien à peu près comme chez notre laboureur canadien, sauf qu'ici la femme n'y mène pas les bœufs ; elle reste à la maison où elle a bien assez à faire si elle est une bonne ménagère, propre et industrieuse, comme la plupart le sont. Elle a bien à faire pour que toute sa maisonnée soit vêtue du lin qu'elle sème, *naye*, file et tisse, et de la laine qu'elle prend sur le dos de ses moutons et qu'elle met en habits entièrement de sa confection sur ceux de sa famille. Sa patience a aussi bien à faire pour que son plancher reste jaune de la couleur du bois naturel, alors que son mari arrive avec ses aides, boueux, crottés, crachant sur ce plancher comme il a fait sur son champ. Car après le souper, tous ils prendront leur pipe. C'est là que j'ai commencé à la haïr, la pipe, et que je n'ai pas cessé depuis, malgré tous les raffinements du tabac frisé, parfumé, et du culot artistique.

Puis ces hommes ont soigné leurs bêtes, cela ne sent pas si bon ; et la lumière dont ils éclairent un peu leur chambre enfumée, ce n'est pas le gaz, ce n'est pas encore le pétrole clarifié, ni même l'huile de lard, mais la chandelle de suif ou l'huile de poisson qui toutes deux ont une odeur nauséabonde ; et c'est la femme de ménage qui a soin de tout cela. Quel rude labeur, après la joyeuse moisson, et avant les fêtes de Noël et du nouvel an ! C'est l'époque de l'année où la nature est dépouillée de sa beauté, où le ciel devient gris ou terne, où les pluies sont fréquentes, où les arbres se dépouillent de leurs feuilles, parfois il est vrai après nous avoir émerveillés de la beauté féerique des teintes d'automne, comme celle de la joue du phtisique qui va mourir. Puis le froid augmente, la terre se durcit par la gelée, il faut rentrer les instruments boueux du labour. A mesure que les jours diminuent et pâlissent, les nuits s'allongent ; partout la boue, l'ombre, l'aspect dénudé de toute la nature, jusqu'à ce que la neige enveloppe la terre molle de son froid et blanc linceul.

Il n'entre point dans le sujet de ce court travail de parler des fêtes de la fin et du commencement de l'année où le laboureur canadien jouissait d'un long chaumage qui n'était point égayé par un vin généreux, mais seulement par le vieux rhum de la Jamaïque, le moins malfaisant des spiritueux.

Après un long hiver, le laboureur canadien reprenait les guérets inachevés. Maintenant tout est changé, les jours sont longs, le soleil est chaud, la terre reverdit, les arbres bourgeonnent, tout parle d'espérance et de promesses. A la fin du labourage du printemps,

les prairies sont déjà émaillées de fleurs, les oiseaux reviennent, la terre s'est rajeunie et parée, tout reluit et chante dans la nature. Mais le laboureur lui ne rajeunit pas. Encore quelques automnes de labourage, et il sera vieux, ses membres seront raidis par le rude travail, ils seront à leur tour labourés de rhumatismes, qui n'ont rien de goutteux, — il n'a pas fait assez bonne chère pour cela, il n'a pas eu assez de bons soins dans sa vie, ni ses ancêtres non plus ; il ne souffre donc pas de l'atavisme d'une vie trop luxueuse chez ses ascendants. Et lui, s'il a pu se couvrir de bonne, quoique grossière étoffe de laine du pays pour les hivers, et parfois d'un chaud habit de fourrure, pendant ses jours de labour il n'avait aux pieds que le soulier de *bœufs*, que pour tenir étanche il fallait huiler et suiffer tous les jours, car cette chaussure n'avait pas atteint la perfection bouillie et raffinée que lui ont donné les trappeurs plus ou moins amateurs de nos jours. La précieuse chaussure de caoutchouc n'avait pas encore pénétré jusqu'au Canada ; et l'on était encore bien loin du luxe, pour les jours de pluie, de pouvoir couvrir ses épaules de l'imperméable que le premier venu peut endosser aujourd'hui.

Aussi, bien que dans la force de l'âge le sommeil du laboureur ait été doux, celui du laboureur vieilli est souvent interrompu. Les changements de temps qui réveillent ses rhumatismes lui procurent de longues insomnies. Ces longs réveils dans les heures sombres et acalmies de la vieillesse sont peut-être une bénédiction nécessaire à celui qui va bientôt s'endormir de ce sommeil sans rêve, profond et doux qui attend quiconque a bien labouré ici-bas. Il n'est peut-être pas nécessaire alors d'être très cultivé pour jeter sur la vie un long et profond regard. Quelle lumière pour l'âme au sein de ces ténèbres et à travers ces paupières fermées, même pour celui qui n'a qu'un horizon borné !

Pauvre laboureur canadien, je t'ai souvent regardé avec intérêt, avec émotion et pitié attendrie pendant que tu traçais ton sillon sans fin pour élargir ta *planche*, puis ta pièce de terre que tu déchires avec peine pour exposer sa chair féconde aux rayons du soleil ; j'ai compris ta fatigue, tes découragements, tes impatiences, tes colères, tes jurements même contre tes bêtes récalcitrantes parfois ; et aussi tes emportement d'impuissance quand le contre-coup du soc de la charrue sur une pierre te faisait lâcher prise ou te secouait comme un mannequin. Malgré ta force et ta vaillance, je t'ai vu laissant tomber une larme dans le sillon fraîchement tracé au souvenir de l'éden à jamais perdu de tes illusions de jeunesse, d'amour et de bonheur. Je t'ai vu aussi t'arrêter avec ton attelage tout fumant, et toi-même le front baigné de sueur, puis te découvrir, t'incliner et joindre ta voix à celle de la cloche lointaine du village, à l'heure de l'angélus, devançant ainsi de bien des années la scène de la fameuse petite toile de Millet sur un sujet analogue ; et je trouvais là, à travers bien des ignorances, la ferme croyance à un éden futur dont les anges gardent les portes pour les ouvrir cette fois à tous ceux qui comprennent bien la salutation de l'ange et qui suivent le Fils de l'homme.

O toi qui as tracé tant de sillons sur la terre, tu seras en bonne compagnie là-haut. Il en est beaucoup d'autres que toi qui ont labouré ici-bas avec larmes et qui moissonnent avec chants de triomphe. Il en est qui labourent l'océan immense pour aller porter ailleurs le fruit de ton travail et de tes sueurs ; eux non plus ne sont pas heureux. Il en est d'autres dont la plume trace ligne après ligne sur le papier, comme des sillons sans fin, le jour, la nuit, afin de labourer l'esprit humain. Chacun son instrument ; et il serait dif-

ficile de dire lequel pèse le plus. Il en est qui labourent le champ des âmes pour y semer la semence divine à l'instar du Fils de l'homme, en vue de la grande moisson du dernier jour ; et ceux-là, s'ils sont sincères, n'ont pas le moindre des labeurs. Vous savez la remarque de celui qui a tracé le plus profond et le plus fécond sillon dans l'humanité : " Que celui qui met la main à la charrue ne regarde pas en arrière."

Que chacun donc trace son sillon, droit, profond, continue, jusqu'au dernier jour d'automne, en attendant le printemps éternel !

VII. — *La Moralité et la Croyance,*

Par le RÉVÉREND M. D. COUSSIRAT.

(Présenté le 28 mai par M. Louis Fréchette.)

Si la critique littéraire a pour objet non seulement de signaler le beau dans les livres, mais d'en montrer les rapports intimes avec le vrai et le bien, nul ne contestera que M. F. Brunetière ne soit maître en cet art. Son remarquable éloge d'Octave Feuillet, dans la *Revue des Deux Mondes* (1er février 1891), plein d'une émotion d'autant plus communicative qu'elle ne lui est pas habituelle, nous en fournit la plus récente preuve. Il y aborde en effet bien des questions d'un intérêt vital. Je me propose d'en examiner une seule — la plus importante — celle qui a été l'inspiratrice des plus célèbres ouvrages de l'élégant romancier, celle-là même qui lui a valu le plus de louanges et attiré le plus de critiques, et sur laquelle l'admiration de M. Brunetière ne l'empêche pas de marquer son dissentiment.

Il s'agit de savoir "si la moralité se fonde nécessairement sur la croyance, et, en dehors du spiritualisme et du christianisme, s'il n'y a point de vertu ".

M. Brunetière répond par " une profession absolue d'incroyance ", mais en prévenant ses lecteurs que cette question ne se décide pas par un haussement d'épaules, — de quoi tous ceux qui se donnent la peine de réfléchir conviendront aisément.

" Actuellement, dit-il, nous pouvons être, sans rien croire ni croire à rien, honnêtes, probes, vertueux ".

Voilà qui est clair, et de nature soit à rassurer les croyants qui craignent de trouver un malhonnête homme dans chaque incrédule, comme Massillon, soit à contenter les incrédules eux-mêmes à qui l'on décerne un brevet d'honnêteté possible en l'absence de toute foi philosophique ou religieuse.

Mais, ajoute-t-il " deux choses sont également vraies : l'une qu'il n'y a jamais eu jusqu'ici de morale qui ne s'appuyât d'une métaphysique, ou qui n'en dérivât, pour mieux dire ; et l'autre qu'il n'y a pas d'idées qui ne se transforment tôt ou tard en principes ou en mobiles d'action. J'en ajoute une troisième : c'est que dix-huit cents ans de christianisme nous ont inoculé, pour ainsi dire, la religion, et que sans le vouloir ou sans le savoir, notre conduite se guide sur des motifs dont l'indépendance religieuse et le caractère scientifiques ne sont rien moins que prouvés ".

Les réserves qui accompagnent cette profession d'incroyance l'atténuent singulièrement. Car enfin, puisque la morale s'est jusqu'ici appuyée d'une métaphysique, ou en est dérivée, est-il probable qu'elle puisse s'en passer désormais ? Tout au moins faudrait-il dire pourquoi et comment elle le peut actuellement, et quels sont les mobiles d'action destinés à remplacer ceux qu'on rejette.

S'il est vrai, en outre, comme vient de l'établir M. Ernest Noaille dans son beau livre

sur le libre arbitre, que toutes les philosophies opposées au spiritualisme et au christianisme aient pour caractère commun la négation du libre arbitre, que devient la morale elle-même ? Sans liberté, point de morale ; il n'y a plus que des mœurs, c'est-à-dire des coutumes, des conventions sociales. Et puisqu'il n'y a pas d'idées " qui ne se transforment tôt ou tard en principes ou en mobiles d'action ", nous sommes menacés d'être tôt ou tard non seulement sans croyances, mais sans morale.

Enfin, " si dix-huit cents ans de christianisme nous ont inoculé la religion ", n'est-ce pas là précisément l'explication du fait que " actuellement nous pouvons, sans rien croire ni croire à rien, être honnêtes, probes, vertueux " ? N'est-ce pas la morale du christianisme, qui, à notre insu et souvent malgré nos dénégations, nous inspire le dégoût ou l'horreur du vice et du crime ? Mais le jour où toutes les croyances religieuses et les convictions philosophiques étant éteintes dans l'esprit humain depuis des siècles, l'inoculation de la morale chrétienne aura perdu son efficacité, l'homme pourra-t-il encore, " sans rien croire ni croire à rien, être honnête, probe, vertueux " ? — Il est regrettable que M. Brunetière ne paraisse pas avoir prévu ce cas, puisqu'il n'en dit rien.

Ces réflexions nous préparent à l'examen direct de la question qu'il faut résoudre, à savoir si la moralité est possible, non pas précisément en dehors de toute croyance positive, mais en dehors de l'influence directe ou indirecte, prochaine ou lointaine, consciente ou inconsciente d'une croyance religieuse ou philosophique ambiante.

Quant à moi, je ne le crois point ; et, pour justifier cette assertion, nous passerons rapidement en revue les quatre principes ou mobiles d'action du plus grand nombre de nos contemporains.

Voici, par exemple, un homme porté au plaisir. La passion le domine et il n'admet, c'est l'hypothèse, d'autre principe que la satisfaction à tout prix de ses penchants. Quel est le frein qui l'arrêterait sur la pente où il glisse ? Pourquoi serait-il " vertueux " sans aucun motif de le devenir ?

En voici un autre qui, toujours par supposition, ne connaît d'autre principe que l'intérêt personnel. Exempt de passions, il sera vertueux peut-être. Mais pourquoi serait-il " honnête et probe " en toute circonstance ? Pour conserver, dira-t-on, sa bonne renommée et, par là, son crédit. Je le veux bien. Admettez cependant — cela s'est vu — qu'il puisse un jour tromper son prochain à l'insu de tous, pour échapper lui-même à la ruine. Quel motif aurait-il de s'en abstenir, puisque l'intérêt est sa seule règle de conduite ? et quelle apparence y a-t-il qu'il s'en abstiendra ?

Il en est peu, je le sais, qui poussent de nos jours la logique du mal jusqu'au bout. Mais ce spectacle nous serait réservé, si tout principe autre que la passion et l'intérêt venait à s'effacer de l'esprit et de la conscience du genre humain.

Bien au-dessus de ces deux mobiles, pures manifestations d'un égoïsme sans scrupules, se place l'honneur, " sentiment, dit Littré, qui fait que l'on veut conserver la considération de soi-même et des autres". Devenu une religion chez quelques-uns, il a remplacé souvent toute religion. L'homme d'honneur accepte un code, qui est sacré pour lui, et il s'y soumet en dépit de sa raison et parfois du bon sens. Le sentiment de l'honneur peut donc tenir lieu, dans certains cas et en quelque mesure, de principes philosophiques et religieux, d'autant plus qu'il emprunte beaucoup d'articles de son code à la philosophie et à la religion, et qu'à ce titre il s'y " appuie ou en dérive ".

Toutefois, à y regarder de près, quelle est sa valeur propre ? S'il n'est pas grossier,

comme les mobiles purement égoïstes, il manque de fixité. Essentiellement relatif, il varie non seulement d'époque à époque, mais de peuple à peuple, et, dans la même nation, il se modifie selon les milieux. Ainsi l'honneur des Anglais n'exige pas le duel dont les Français et les Allemands abusent, et les ouvriers de tous pays vident leurs querelles non à coups d'épée, mais à coups de poing ou à coups de couteau.

Ne sait-on pas, de plus, que le code de l'honneur renferme d'étranges anomalies ? Il retranche de la société le joueur malheureux qui ne paie pas les dettes qu'infligent les caprices de la fortune, mais il tolère maint financier véreux. Il flétrit l'infidélité conjugale, quand elle s'affiche, mais il admire le séducteur qui, requin des salons du grand ou du petit monde, flaire les ménages en détresse et achève savamment leur ruine. Il condamne l'assassinat, mais souvent il provoque au meurtre pour de puériles raisons, grâce au prestige qu'il attache encore au duel.

C'est que le sentiment de l'honneur n'est après tout que l'expression de la moralité moyenne des cercles où l'on se meut, et cette moralité s'élève ou s'abaisse avec les croyances elles-mêmes. L'analyse le réduit à n'être qu'une convention sociale, non dans son origine sans doute, mais dans son contenu. M. Villemain a dit que, au dix-huitième siècle, la morale était plus corrompue que les mœurs. Soyez assurés que, sans le renouveau chrétien du commencement de notre siècle en Europe, les mœurs seraient tombées au niveau de la morale que l'on professait, car "les idées tôt ou tard se transforment en mobiles d'action".

Insuffisant, quoique utile, est donc le principe de l'honneur pour incliner dans toutes les circonstances l'homme à devenir "honnête, probe" et surtout "vertueux". Les scandales qui éclatent de temps en temps sur les hauteurs du grand monde légitiment les craintes que fait naître à cet égard la réflexion.

La seule base sur laquelle on puisse fonder inébranlablement la moralité, c'est le devoir. Fais le bien, fuis le mal ; tel est l'ordre qu'entend tout homme dans sa conscience à l'éveil de sa vie morale, et il se sent tenu d'y obéir. On peut discuter sur la nature du bien et celle du mal ; on peut varier touchant les applications de ce qu'on a appelé l'impératif catégorique ; mais, outre qu'il y a des points acquis, comme le devoir de respecter la vie, la propriété, l'honneur du prochain, — que ce prochain soit l'homme en général ou seulement l'homme de la tribu dont on fait partie, — ce commandement subsiste et il s'impose à tous les honnêtes gens.

C'est ce que reconnaît et proclame l'école dite de la morale indépendante. Mais, en constatant ce fait, elle a le droit d'en nier les conséquences, puisqu'elle prétend affranchir la morale de toute métaphysique comme de toute religion.

Or, le philosophe Kant a eu l'honneur de démontrer avec une logique rigoureuse que la loi morale qui nous régit a trois postulats : cela veut dire que trois notions sont nécessairement contenues dans l'idée du devoir.

En effet, la loi qui m'est imposée suppose que je puis ou l'accomplir ou l'enfreindre. Car, si j'étais contraint de faire soit le bien soit le mal, cette loi serait inutile ; et si je ne pouvais faire ni l'un ni l'autre, elle serait absurde. Il faut donc que je sois libre jusqu'à un certain point, d'obéir ou de désobéir à la loi de ma nature. Le premier postulat du devoir est la liberté morale.

En outre, toute loi pour être véritable doit avoir une sanction ; elle doit être accompagnée de récompenses ou de châtiments, selon qu'on l'observe ou qu'on la transgresse. Or, les sanctions de la vie présente, — celle de la nature, celle de la loi, celle de l'opinion,

celle de la conscience même, — sont manifestement insuffisantes ; rien de plus facile que de le démontrer. Il faut donc que dans une autre vie s'exerce la justice parfaite et que l'harmonie naturelle entre la vertu et le bonheur soit rétablie. De là, le second postulat de la loi morale : l'immortalité personnelle de l'âme.

Enfin, je ne me suis pas donné cette loi ; elle m'est imposée. Je ne puis ni l'abolir — pour supprimer les remords, par exemple — ni la modifier à mon gré. De quelque manière qu'elle se soit formée et développée en moi, elle me domine. Elle doit donc son existence à l'Auteur de mon être, lequel est en même temps le réparateur des injustices d'ici-bas. L'existence de Dieu est le troisième postulat du devoir.

Que l'on excuse ces idées ; l'on se convaincra que le fait du devoir implique une métaphysique qui sert elle-même de base à toute religion. La morale qui repose sur ce fait, ne saurait donc être indépendante.

C'est la gloire de la philosophie spiritualiste moderne d'avoir maintenu et défendu ces grandes vérités. Octave Feuillet — dont je ne professe pas d'approuver l'œuvre entière — a mis au service de la même cause la brillante imagination, la délicatesse, le bon goût, la puissance dramatique, toutes les qualités qui ont fait de lui un romancier et un dramaturge célèbre. Il a souvent montré comment devraient agir, s'ils étaient logiques, dans les situations les plus complexes de la vie, un incrédule sans frein et un croyant sans défaillances. Tous les critiques s'accordent à reconnaître que ses personnages sortent de la nature pour trop se conformer à une théorie. Malgré ce défaut, sa thèse reste vraie en général. Nous croyons comme lui, après examen, qu'il ne peut y avoir de moralité, sinon sans croyances personnelles ou traditionnelles, du moins sans "inoculation séculaire" de quelques principes religieux ou philosophiques fondés eux-mêmes sur ce qu'il y a de plus grand dans la nature humaine : le devoir.

VIII — *Jacques Cartier : Questions de droit public, de législation et d'usages maritimes,*

Par L'ABBÉ HOSPICE VERREAU, LL.D.

(Lu le 27 mai 1891.)

I

Dans mon étude précédente sur Jacques Cartier [1], j'ai fait observer combien Charles-Quint paraissait inquiet des tentatives de découvertes que François Ier essayait du côté de l'Amérique. L'ambassadeur espagnol auprès de la cour du Portugal, obéissant très probablement aux instructions de son maître, alla jusqu'à prier D. Joan de s'unir à l'empereur dans une expédition commune contre Cartier et ses trois vaisseaux [2]. Il s'agissait tout simplement de massacrer l'équipage entier, afin de frapper la France de terreur et d'empêcher les Français — sinon pour toujours, du moins pour longtemps — de songer à des établissements par delà l'océan Atlantique. Charles V était un voisin puissant et ombrageux. Si D. Joan n'avait pas toutes les qualités brillantes de son père Emmanuel le Fortuné, il en avait la fermeté et la générosité. Aux propositions et aux sollicitations pressantes de l'ambassadeur, il se contenta de répondre, que les endroits explorés par Cartier étaient en dedans de la ligne de démarcation du Portugal, et que les tentatives de colonisation du roi de France ne lui inspiraient aucune inquiétude [3].

Je laisse l'Espagnol exhaler sa mauvaise humeur dans sa missive à l'empereur, et je réponds à la question qu'on ne peut manquer de me poser : Que faut-il entendre par ligne de *démarcation* dont parle le roi du Portugal ?

Pour cela, je dois remonter à la découverte de l'Amérique.

A peine Colomb était-il de retour de son premier voyage, que le pape Alexandre VI par une bulle restée célèbre, en date du 4 mai 1493 [4], accorda à l'Espagne " toutes les îles et la terre ferme découvertes et à découvrir, et non encore occupées par un prince chrétien ", pourvu qu'elles fussent enfermées dans un espace qu'il détermina par des lignes astronomiques acceptées comme lignes de *démarcation* [5]. Après avoir tracé un méridien qui passait à cent lieues à l'ouest de la plus occidentale des îles Açores et du cap Verd, il semble l'avoir coupé par un parallèle tiré à la hauteur des Açores. C'étaient les deux côtés d'un vaste parallélogramme où le pape défendait aux autres nations — sous peine

[1] Mémoires de la Société Royale du Canada, t. viii, 1re section, p. 121.

[2] *Coleccion de varios documentos para la historia de la Florida*, Buckingham Smith, p. 112. *Mém. de la S. R. C.*, t. viii, 1re section, p. 145.

[3] *Ibid.*, p. 146.

[4] Voir note A, à la fin de cette étude.

[5] Cf. Littré, au mot *ligne*. Malgré l'autorité du savant auteur du *Dictionnaire*, il est douteux qu'on ait donné le nom de *marcation* aux lignes indiquées par Alexandre VI. Il est certain qu'à cette époque les Espagnols employaient le mot *démarcation* comme synonyme de *limite*. Quant au passage cité de Montesquieu, il n'est pas exact. La bulle *Inter cetera* protégeait l'Espagne aussi bien contre les Français et les Anglais que contre les Portugais. Quand surgit le différend des îles Moluques, Alexandre VI était mort depuis longtemps.

d'excommunication — de pénétrer, soit pour s'établir, soit pour commercer, sans la permission de l'Espagne. Prolongée indéfiniment vers l'occident, cette concession pouvait conduire les Espagnols jusqu'aux Indes. Aussi, les Portugais, qui cherchaient depuis longtemps le chemin le plus court pour pénétrer dans cette riche contrée, se montrèrent-ils alarmés : ils feignirent d'être lésés dans un de leurs droits les plus importants, et réclamèrent auprès de l'Espagne. Des négociations s'ouvrirent, et bientôt un traité fut conclu à Tordesillas entre les deux puissances, le 7 juin 1494. Les lignes de démarcation furent changées ou plutôt on n'en admit qu'une seule, celle du méridien qui passait à 370 lieues à l'ouest des iles du cap Verd. Le Portugal gardait toutes les terres découvertes et à découvrir situées en deçà, soit au nord, soit au sud de l'équateur[1]. Cet arrangement protégeait ses possessions d'Afrique, et devait lui donner le Brésil, qui n'était pas encore découvert, ainsi qu'une partie considérable du territoire connu aujourd'hui sous le nom d'Amérique anglaise. Le Portugal gardait — sinon la part du lion — du moins le champ le plus vaste pour ses exploitations et pour les entreprises de ses intrépides marins[2].

On comprend maintenant comment le roi du Portugal pouvait répondre à l'ambassadeur d'Espagne que Baccalaos ou Terre-Neuve était dans sa démarcation.

Le traité de Tordesillas nous aide à expliquer — en les éclairant d'une plus grande grande lumière — certains faits qui avaient paru obscurs jusqu'à présent.

1o Ainsi, c'est pour affirmer leurs droits que les Portugais firent de bonne heure des tentatives de découvertes dans la direction du nord, quoiqu'ils eussent un champ très vaste pour leur ambition du côté de l'Afrique. Le premier voyage de Gaspard Cortereal est antérieur à 1500[3].

2o Les Espagnols — jusqu'à l'époque qui nous occupe — ne paraissent pas avoir poussé leurs excursions dans l'Amérique du Nord au delà de 42° 30[4], c'est-à-dire à peine au delà des Açores, qui sont aujourd'hui marquées à la hauteur de 40°, et encore, leurs tentatives commencèrent assez tard. Celle de Vasquez de Ayllon se fit en 1520, et celle de Estevan Gomez en 1525. Les Espagnols se tenaient évidemment dans les bornes de la concession d'Alexandre VI et de leur convention avec le Portugal.

3o Pour la même raison, les plus anciennes cartes de l'Amérique Septentrionale sont dues aux Portugais. Les Espagnols n'ont fait que copier les cosmographes portugais :

"Ces habiles dessinateurs, savants pilotes pour la plupart, exercèrent une influence considérable, non seulement par leurs œuvres, mais aussi par leurs préceptes, dont on reconnait facilement les traces dans les portulans et les planisphères dressés aux Baléares, en Espagne et en France[5]."

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[1] Y que todo lo que hasta aqui tenga hallado y descubierto, y de aqui adelante se hallare y descubriere por el dicho Senor Rey de Portugal y por sus navios, asi islas come tierra-firme desde la dicha raya arriba, dada en la forma suso dicha, yendo por la dicha parte de Levante dentro de la dicha raya á la parte de Levante, ó de Norte ó de Sur de ella, tanto que non sea atravesando la dicha raya, que esto sea y quede y pertenezca al dicho Senor Rey de Portugal, &c., &c. (Navarette, *Colleccion de los Viages*, etc., t. 2, p. 136.)

[2] Si le mot historique que l'on prête à François I, sur le partage du nouveau monde, a jamais été prononcé par un roi de France, c'est à l'occasion du traité de Tordesillas qu'il a dû l'être.

[3] Cf. *Les Corte Real et leurs voyages au nouveau monde*, par Harrisse, Paris, 1882.

[4] Entre 40° et 42°, selon Oviedo, cité par Harrisse dans *Jean et Sébastien Cabot*, p. 73.

[5] Harrisse, *Jean et Sébastien Cabot*, p. 140.

Harrisse à qui je viens d'emprunter cette citation, est le premier, je crois, qui ait signalé le fait ; c'est lui au moins qui l'a établi d'une manière incontestable ; mais il n'en a pas cherché la cause, qui se trouve dans le partage du nouveau monde fait à Tordesillas entre l'Espagne et le Portugal.

4o On comprend dès lors pourquoi les premiers noms donnés aux différentes parties du littoral, depuis l'extrémité nord de la Floride jusqu'au Labrador, sont portugais.

D'après Harrisse, " les contours et les positions dans les portulans des premières vingt-cinq années du XVIe siècle, sont évidemment copiés sur des cartes lusitaniennes, de même les noms de ports, de caps, d'estuaires, de rivières, depuis le Labrador jusqu'au cap Rasso, et depuis la terre de Cortereal jusqu'à celle de Estevan Gomez ", sont presque tous portugais [1]. L'exception qu'on peut citer pour le nord-est de Terre-Neuve, où Cartier trouve des noms français et bretons, sera expliquée plus loin.

5o Il est naturel de croire que les Portugais ont fait des essais de colonisation sur quelques points des pays découverts ou occupés par eux, tels que le cap Breton, et la Nouvelle-Ecosse [2].

6o Par là, enfin, tombent toutes les assertions publiées sur la présence — à la fin du XVe siècle, — des Espagnols à l'île de Terre-Neuve et dans le golfe. Cela couperait court aux conséquences qu'on a cherché à tirer de leurs prétendus voyages en ces quartiers.

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Je reviens aux sinistres projets que l'ambassadeur de Charles-Quint nourrissait contre l'expédition de 1541.

L'Espagne pouvait-elle empêcher les Français de coloniser quelque partie du nouveau monde ? Oui, si les Français voulaient s'établir en dedans des limites que le pape Alexandre VI lui avait assignées. Tel était le droit public, admis à cette époque par les nations catholiques — surtout par la France, qui cherchait à en bénéficier du côté de l'Italie.

Ces limites, l'Espagne s'efforçait probablement de les reculer aussi loin que possible pour étendre le champ de ses possessions, aidée par la phraséologie du bref pontifical, et de l'axiome toujours invoqué dans de pareilles circonstances : *favores ampliandae.* Elle pouvait prétendre, même après le traité de Tordesillas, que le Portugal n'avait été admis au partage qu'à titre de bon frère, sans que les pénalités imposées par le Saint-Siège cessassent d'exister pour les autres puissances.

Il semble que telles étaient les prétentions d'Isabelle et de Ferdinand quand Henri VII d'Angleterre voulut accepter les services de Cabot, qui lui offrait d'aller à la recherche de terres nouvelles : ils firent prévenir ce monarque qu'une pareille entreprise ne pouvait s'exécuter sans porter préjudice à l'Espagne et au Portugal [3].

Mais ces prétentions, qui n'avaient pas arrêté le voyage de Cabot, avaient dû finir par être abandonnées. Dans tous les cas, Cartier en 1541, comme Cabot en 1497, naviguait bien loin de la démarcation pontificale.

Là, s'il n'était pas exposé aux censures ecclésiastiques, il était cependant exposé encore à d'autres difficultés : il pouvait, par exemple, être arrêté au passage et repoussé par la force, du moment qu'il voudrait pénétrer dans un pays déjà occupé par une nation chrétienne. C'était le droit du premier occupant, droit également reçu et respecté par tous les princes, alors encore plus qu'aujourd'hui.

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[1] *Ibid.*, p. 143.

[2] Harrisse, *Jean et Sébastien Cabot*, p. 76, notes 1 et 2.

[3] Non se puede entender en esto syn perjuisio nuestro o del Rey de Portogal. (*Dépêche des Rois catholiques* à leur ambassadeur à Londres, citée par Harrisse, *op. cit.*, p. 315.

Alexandre VI avait respecté et réservé ce droit d'une manière très explicite dans sa bulle[1]. Henri VII l'avait aussi réservé dans la concession très étendue qu'il faisait à Cabot[2]. C'est en vertu de ce droit que les Bretons et les Portugais me paraissent avoir fait la pêche tranquillement, les uns au nord, les autres au sud de Terre-Neuve.

Ce droit du premier occupant, François Ier l'avait prévu, et il avait donné à son lieutenant-général des instructions précises, qui auraient pu le justifier aux yeux de l'Europe, si l'empereur avait voulu l'accuser publiquement, comme il avait fait déjà dans plusieurs circonstances. François Ier, beaucoup moins diplomate que son rival, voulait se montrer aussi prudent que lui et éviter de donner le moindre prétexte à une rupture. Il justifiait, sous ce rapport, le jugement que le cardinal de Séville avait porté sur ses intentions[3].

Quoi qu'il en soit, dans la commission accordée à Roberval en 1541, il a soin de déclarer qu'il ne veut prendre possession que des terres non encore occupées par des princes chrétiens. Tous les termes me semblent avoir été pesés attentivement : . . . . " Nous avons advisé et délibéré de renvoyer esdits pays de Canada et Ochelaga et autres circonjacens mesme en tous pays transmarins et maritimes inhabitez ou non *possédez et donnez par aucuns princes chrétiens.*" Plus loin il précise davantage : " Pourvu toutefois que ce ne soient pays tenus, occupez, possédez et dominez ou estans sous la subjection et obéissance d'aucuns princes ou potentats nos alliez et confédérez, et mesme (*sic*) de nos très chers et amez frères l'empereur et le roy de Portugal[4]."

Par ce *proviso*, François Ier reconnaissait les droits acquis, mais il faisait clairement comprendre qu'il en connaissait aussi la limite. De son côté, Charles n'ignorait pas cette déclaration, dont son ambassadeur en France lui avait transmis une traduction, mais il craignait que les Français en pénétrant dans l'intérieur du continent par le fleuve Saint-Laurent, ne pussent arriver facilement aux côtes de l'océan Pacifique, et ne vinssent à menacer les conquêtes de Cortez. C'est pour cela qu'en dépit du refus du roi de Portugal, et malgré l'avis du conseil des Indes, il envoya une caravelle observer les mouvements de Cartier.

Harrisse pense que cette caravelle était commandée par Ares de Sea. Partie de Bayonne en Galice le 25 juillet 1541, elle serait revenue en Espagne le 17 novembre suivant. On sait que Cartier, qui avait pris la mer le 23 mai, ne put arriver à Québec qu'à la fin d'août. Les tempêtes qui retardèrent sa marche durent arrêter aussi celle de la caravelle, et il est probable que notre découvreur commençait déjà à jeter les fondations de son établissement quand Ares de Sea aborda aux côtes de Terre-Neuve. Fût-il arrivé plus

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[1] ".... Ita quod omnes insulae et terrae firmae repertae et reperiendae, detectae et detegendae a praefata linea versus occidentem et meridiem par alium regem aut principem christianum non fuerint actualiter possessae usque ad diem nativitatis D. N. Jesu Christi proxime praeteritum in quo incipit annus praesens M. cccclxxxx tertius quando fuerunt per nuntios et capitaneos vestros inventae aliquae praedictarum insularum."

Et plus loin :

" Decernentes nihilominus per hujusmodi donationem, concessionem et assignationem nostram nullo christiano principi qui actualiter praefatas insulas aut terras firmas possederit usque ad praedictum diem nativitatis D. N. Jesu-Christi, jus quaesitum sublatum intelligi posse aut auferri debere." (Bulle *Inter cetera*, copie prise aux archives du Vatican, Alex. VI, Bullar. No. 177, fol. 192.)

[2] Ad inveniendum, discooperiendum et investigandum quascumque insulas, regiones sive provincias gentilium et infidelium in quacumque parte mundi positas *quae christianis omnibus ante haec tempora fuerunt incognitae.* (Lettres Patentes accordées par Henri VII à Cabot, publiées par Rymer, Harrisse, etc.)

[3] Cf. Lettre du cardinal de Séville à Samano, traduite dans mon premier mémoire sur Jacques Cartier, p. 145.

[4] Commission accordée à Roberval par François Ier, Harrisse, *Notes* pour servir, etc., pp. 248 et 247.

tôt, il n'aurait trouvé à Carpont que deux vaisseaux français, ceux de Cartier et du vicomte de Beaupré : ces navires étaient lourdement chargés ; il n'est pas certain qu'ils eussent eu le dessus s'ils avaient été attaqués [1].

L'idée d'éloigner les Français du nouveau monde a été la préoccupation constante de Charles-Quint.

Pendant les longues négociations au sujet du Milanais, auquel François tenait beaucoup, l'empereur manifesta un jour la volonté d'abandonner ses prétentions sur cet état en faveur de la France, à certaines conditions, parmi lesquelles se trouvait la suivante : "Que ledit roi de France renonce et promette solennellement et très expressément et aussi sesditz enfants de jamais pouvoir contraiter (trafiquer), ni naviguer au coustel des Indes selon aussi qu'il sera exprimé et désigné à l'entière sheurté de sadite Majesté impériale et dudit roi de Portugal, de manière que ledit roi de France ni sesdits enfants y puissent jamais rien entreprendre" [2]. C'était au mois de novembre 1535 — la date mérite d'être remarquée — que Charles dictait ces conditions.

En 1548, dans les dernières instructions qu'il prépare pour Philippe II, son fils, il expose sa politique avec une certaine insistance : "Pour ce qui concerne les Indes, vous ne cesserez d'avoir l'œil sur les Français, afin de vous assurer s'ils ont le dessein d'y envoyer une flotte, soit ouvertement, soit d'une autre manière, avertissant les gouverneurs de ces parages de se tenir sur leurs gardes, afin d'être prêts à résister en cas d'attaque. Dans toutes leurs tentatives précédentes, faites dans ces climats lointains, on a remarqué que leurs flottes n'ont pas résisté longtemps, et lorsqu'on met de la vigueur dans la défense, ils faiblissent aussitôt et lâchent pied. Il importe beaucoup de tenir au premier choc, et il n'importe pas moins que vous vous mainteniez en bonne intelligence avec le Portugal, particulièrement dans l'intérêt de la défense des Indes [3]."

A la vue de cette persistance de la politique espagnole, on peut se demander ce qui serait arrivé si le Portugal avait voulu s'y associer pour l'Amérique Septentrionale, comme il a fait pour l'Amérique du Sud. Le Saint-Laurent aurait-il vu sur ses rives une colonie portugaise, un autre état du Brésil — empire ou république — avec des éléments nouveaux ? Le climat âpre et rigoureux du nord, un labeur incessant pour féconder le sol avare de ses produits, la lutte sans trève contre les Indiens auraient-ils fait subir au caractère des Portugais des changements physiques et physiologiques aussi marqués qu'à celui des Français et des Anglais ? Il est permis de poser ces questions, quand on compare ce qui s'est passé dans les deux Amériques.

Quoi qu'il en soit, les relations de bonne amitié que la France entretenait avec le Portugal expliquent comment elle put étendre son commerce sur les côtes de l'Afrique et du Brésil. Si les vaisseaux de François Ier remontèrent le fleuve Saint-Laurent en 1541 sans qu'on vînt leur barrer le passage, ce fut grâce aux sentiments généreux de don Joan qui fit prévaloir les devoirs d'allié fidèle sur les calculs ambitieux du conquérant [4].

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[1] C'est de ce voyage de Sea que Harrisse fait dater les connaisances des cosmographes espagnols sur les îles de Terre-Neuve et du cap Breton : op. cit., p. 146.

[2] Papiers de Granvelle, t. 1, p. 404.

[3] Papiers de Granvelle, t. 2, p. 295.

[4] Je n'ai pas la prétention de faire connaître les divers motifs qui inspirèrent la conduite du roi du Portugal, et la tâche serait d'ailleurs presque impossible, car on ne fait que d'ouvrir les archives officielles de ce royaume. Mais il ne faut pas oublier que François Ier avait épousé — 4 juillet 1530 — la reine douairière du Portugal, Eléo-

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Une autre question de droit international se présente à l'esprit de celui qui étudie les essais de colonisation de François I. De quel droit venait-il s'emparer du sol occupé par des nations réputées barbares, il est vrai, mais qui n'étaient pas sans une certaine civilisation ?

Si l'on examine la question au point de vue des sauvages, la discusion ne saurait être bien longue.

Quoique ces peuples eussent un territoire, ce territoire n'avait point de bornes précises et fixes. On peut dire que chez eux, c'était le droit du plus fort qui dominait. De même qu'ils attaquaient souvent leurs voisins sans provocation, ils reconnaissaient qu'ils pouvaient être attaqués à leur tour, au moment où ils y pensaient le moins. La terre appartenait à celui qui savait la garder. Ils n'auraient eu, sous ce rapport, aucun reproche à faire aux Français. Cependant nous verrons plus loin que François Ier a voulu respecter la propriété, même chez ceux qui n'en reconnaissaient pas.

Mais il faut avouer qu'à cette époque, personne — pas plus les Espagnols que les Portugais, pas plus François Ier que Henri VII d'Angleterre — n'admettait chez ces malheureux peuples le droit à l'autonomie et à l'indépendance : leur état de barbarie justifiait ceux qui voulaient les amener à la civilisation, même par la force des armes.

Telle était l'opinion soutenue par les écrivains les plus autorisés, entre autres par Vittoria, opinion dont on trouve des reflets dans les écrits de Grotius : les souverains, ne dépendant de personne, avaient le droit d'empêcher la violation du droit de la nature et des gens, et par là, ils étaient justifiables d'employer la force des armes pour soumettre à leur puissance les peuples qui se rendaient coupables de cette double faute.

Cependant de tous les princes qui songèrent à étendre leurs domaines par des découvertes et des conquêtes dans le nouveau monde, François Ier est celui qui semble avoir montré le plus de respect pour les indigènes et de modération dans ses projets. Les lettres patentes accordées à Cartier ou à Roberval, en sont la meilleure preuve, et cette preuve ressort encore plus éclatante quand on compare ces lettres à la commission donnée aux Cabot par Henri VII.

Le roi d'Angleterre ne paraît avoir eu d'autre motif que de s'agrandir. Du premier coup, il concède à ses pilotes le droit d'arborer ses bannières dans chaque ville, cité ou camp qu'ils pourront découvrir, habités par des payens ou des infidèles ; il les constitue les vassaux de sa couronne, avec obligation de payer le cinquième des profits réalisés.

Nous ne trouvons rien d'aussi radical dans les commissions de Cartier qui nous sont parvenues. François Ier ne paraît songer d'abord qu'à faire découvrir et explorer les terres inconnues jusque-là. C'est au moins ce qui ressort de la *complainte* et *doléance* de Cartier devant la cour de Saint-Malo.

Puis, quand il a quelque connaissance du pays et des hommes qui les habitent, frappé des bonnes qualités de ceux-ci, il songe à les civiliser. Mais qu'on mette de côté, si l'on

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nore d'Autriche, veuve de D. Manoel. Il paraît que cette reine, aussi digne que pieuse, fut estimée et respectée de son nouvel époux, sur qui elle exerçait une certaine influence politique. Elle n'a peut-être pas été étrangère à la persistance que François Ier mit dans ses projets de découvertes. Cependant, la plupart des historiens français semblent ignorer son existence dans leur pays, et Isambert va même jusqu'à dire que le mariage ne fut pas conclu. (*Recueil général des anciennes lois françaises*, Paris, 1823, t. 12, p. 254, note.)

veut bien, les motifs de civilisation et même ceux de religion souvent invoqués, pour ne s'attacher qu'aux pouvoirs accordés au découvreur : Cartier n'en reçut pas d'autres que ceux de "plus avant entrer esdictz pays, converser avec les dictz peuples d'iceux et avec eux habiter si besoin est, etc [1]."

Il faut remarquer que ce commencement d'autorité ne fut donné que pour la troisième expédition, c'est-à-dire pour celle qui aboutit aux essais infructueux de Roberval.

Ce dernier, il est vrai, reçut avec les pouvoirs plus amples pour former l'expédition, pour fonder des établissements et les administrer, l'autorisation de faire la guerre et d'opérer des conquêtes si les voies de l'amitié et de la douceur ne suffisaient pas [2] pour amener les peuples à la France. L'hypothèse était probable, elle était même prudente, mais elle n'était pas le but de l'entreprise. En effet, la commission ajoute presque aussitôt : "Pourvu toutefoys que ce ne soyent pas pays *tenus, occupez, possédez et dominez* ou estans sous la subjection et obéissance d'aucuns princes ou potentats nos alliés". Je n'ai pas besoin de faire remarquer que les mots soulignés ont un sens absolu, ils rappellent, en l'accentuant fortement, l'idée exprimée au début de la commission, c'est-à-dire que François Ier n'entendait pas s'emparer des lieux occupés par les indigènes.

Voilà, je crois, en résumé toute la politique que la France a suivie dans sa colonisation du Canada : traiter les sauvages en amis, les amener volontairement à la civilisation, tout en leur faisant sentir au besoin la force de ses armes. François Ier a poussé encore plus loin les précautions. De crainte que des particuliers, entraînés par l'amour du lucre, n'en vinssent par leurs violences à exciter les préjugés des sauvages et à les irriter contre les Français, le roi défendit de tenter aucune autre entreprise de ce côté.

Enfin Cartier en établissant sa colonie *au-delà de Canada*, comme il nous l'apprend, et en choisissant un endroit inhabité, semble avoir voulu se conformer à l'esprit de la commission donnée à Roberval, autant que se mettre à l'abri de toute surprise.

(*A continuer* [3].)

Note A.

J'avais eu l'intention d'étudier ici, sous différents points de vue, les trois bulles d'Alexandre VI qui se rapportent aux découvertes des Espagnols. C'est pour cela que j'en ai fait prendre, aux archives du Vatican, des copies aussi exactes que possible. Mais comme la matière me semble pleine d'intérêt historique, je me suis décidé à remplacer cette note par une étude spéciale que je publierai dans le prochain volume de nos Mémoires.

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[1] Le texte continue : "afin de mieux parvenir à notre dite intention et faire chose agréable à Dieu." Ramé, p. 13 de l'appendice.

[2] Avons donné . . . pouvoir, autorité et mandement espécial . . . de passer et repasser, aller et venir esdits pays estranges, de descendre et entrer en iceux et les mettre en nostre main, tant par voye d'amitié ou amyable composition si faire se peulx, que par force d'armes, main forte et tout autres voyes d'hostilité, etc." Harrisse, *Notes pour servir à l'histoire . . . de la Nouvelle-France*, Paris, 1872, p. 246.

[3] La maladie a empêché l'auteur de mettre la dernière main à la seconde partie de son Mémoire. Elle sera publiée plus tard.

IX — *Grammaire de la langue algonquine,*

Par M. L'ABBÉ CUOQ.

(Présentée le 30 mai 1890.)

PREMIERE PARTIE.

SOMMAIRE : I. Notions préliminaires. — II. Le nom. — III. L'adjectif. — IV. Le pronom. — V. Introduction au verbe. — VI. Verbes absolus. — VII. Verbes relatifs. — VIII. Verbes à régime inanimé. — IX. Verbes passifs. — X. Verbes dialogués. — XI. Verbes réfléchis et verbes réciproques. — XII. Verbes unipersonnels. — XIII. Le participe. — XIV. La particule verbale. — XV. La préposition. — XVI. L'adverbe. — XVII. La conjonction. — XVIII. L'interjection. — XIX. Noms de nombre. — XX. Noms de parenté et d'affinité.

CHAPITRE I. NOTIONS PRÉLIMINAIRES.

1. L'alphabet algonquin se compose de dix-neuf lettres :

a, b, c, d, e, g, h, i, j, k, m, n, o, p, s, t, v, w, z.

Ces lettres se prononcent comme en français, sauf les exceptions suivantes :

c a toujours la valeur de notre *ch* dans les mots *chat, chien, cheval, chocolat, poche, chiche.*

e équivaut à notre *é* fermé, et s'il est accentué, à notre *è* ouvert.

g, s, t sont toujours durs, et ne s'adoucissent jamais, c'est-à-dire qu'ils conservent, comme en grec, leur son naturel, quelle que soit la place qu'ils occupent dans le mot, ou la voyelle qui les accompagne.

h est plus ou moins aspiré, excepté quand il se trouve placé après N ; dans ce cas, il a pour emploi de rendre nasal le son de l'*n*.

n suivi d'une consonne, sauf *w*, est toujours nasal.

i ne perd pas, comme en français, le son qui lui est propre, en présence de *n* nasal. Ainsi, par exemple, dans le mot *indi, là*, l'*i* initial se prononce *i*, tout comme celui de la fin du mot, et non pas *é*, comme il arrive en français dans le mot *indigne.*

v n'a le son du *v* français que dans quelques noms propres, comme *Ninive, Octave,* que l'on écrit *Niniv, Oktav.* Partout ailleurs le *v* algonquin est voyelle ; sa place est toujours à la fin d'un mot, et à la suite d'une autre voyelle avec laquelle il forme une diphtongue : *-av, -ev, -iv, -ov.* C'est un *demi-w*, si l'on peut parler ainsi, et qui se prononce à peine.

w a la valeur du *w* anglais ; il est consonne au commencement d'un mot, et aussi quand il commence une syllabe ; il est voyelle quand il est immédiatement précédé de toute autre consonne que *h*. Ainsi dans le mot *wiwakwan*, chapeau, les deux premiers *w* sont consonnes, le troisième est voyelle.

2. Résumons ce qui précède, et rendons-le encore plus clair au moyen de deux exercices :

a) Mots algonquins avec leur transcription d'après la prononciation française :

Acama, *a-cha-ma*, on lui donne à manger ;
Wabiceci, *oua-bi-ché-chi*, martre ;
Cicib, *chi-chib*, canard ;
Cominabo, *cho-mi-na-bo*, vin ;
Getimagisidjik, *ghé-ti-ma-ghi-ci-djik*, les misérables ;
Anwi, *a-nui*, flèche ;
Anamanhwang, *a-na-man-ouang*, sous le sable ;
Aianwetangik, *a-ya-nouê-tan-ghik*, les indociles ;
Misisipi, *mi-ci-ci-pi*, le Mississipi ;
Misisagek, *mi-ci-ça-ghek*, les Mississagués.

b) Mots français avec leur transcription d'après la prononciation algonquine :

Chicane, *ci-kan ;* chat, *ca ;* chatte, *cat ;*
J'ai mangé, *je manje ;* gaucher, *goce ;*
Pitié, *pitie ;* piété, *piete ;*
Bon, *bonh ;* bonne, *bon ;*
Moyen, *mwaienh ;* moyenne, *mwaien ;*
Coquin, *kokenh ;* coquine, *kokin ;*
Empoisonner, *anpwazone ;*
Cochinchine, *kocencin ;*
Indigence, *endijans.*

3. On algonquinise ceux des noms propres qui sont d'un usage plus fréquent ; ainsi les mots Pierre, Paul, Joseph, Michel, Etienne, Marie, Susanne, Eugénie, Charlotte, Philomène, Jérusalem, Nazareth, s'écrivent :

Pien, Pon, Jozep, Micen, Etien, Mani, Sozan, Ijeni, Canot, Pinomen, Jenozanem, Nazanet.

JEANNE devra s'écrire *Jan*, et pour JEAN, il faudra y ajouter un *h* afin d'en nasaliser le son : *Janh.*

VINCENT, VIRGINIE, VÉRONIQUE, s'écrivent et se prononcent : *Bensanh, Bijini, Benonik.*

4. Les Algonquins ont adopté un certain nombre de mots français qu'ils prononcent à leur manière. Ainsi, pour : " bouton, mouchoir, bonjour, la bière, la soupe, la melasse, du ragoût, du pâté, des choux, des rubans, vingt sous," ils disent :

" Boto, mocwe, bojo, nabien, nasop, naminas, dinago, dipate, deco, deniband, benso."

5. On compte en algonquin quatorze diphtongues : " Ai, ei, ia, ie, io, av, ev, ov, aw, ew, iw, wa, we, wi," et deux triphtongues : " wai, wei ; " il n'est jamais diphtongue et le mot aii doit se partager en trois syllabes *a-i-i*. Dans aiaa, il y a une diphtongue entre deux *a* : " a-ià-a."

6. L'allongement des mots occasionne souvent une permutation dans leur terminaison, et alors les consonnes *fortes* se changent d'ordinaire en leurs correspondantes *douces*. Le tableau suivant les fera distinguer les unes des autres :

TABLEAU DES CONSONNES SUJETTES A LA PERMUTATION.

	FORTES	DOUCES
Labiales.....	P	B
Dentales.....	T	D
Gutturales...	K	G
Chuintantes..	C	J
Sifflantes	S	Z

L'adoucissement n'a pas lieu dans l'ordre des labiales ; on dit : cingop, *un sapin*, cingopik, *des sapins*, non plus que dans les chuintantes : cimaganic, *soldat*, cimaganicak, *soldats*, à moins que la

chuintante ne se trouve précédée d'une dentale ; dans ce cas, l'une et l'autre doivent s'adoucir : saiakihite, *celui qui m'aime*, saiakihidjik, *ceux qui m'aiment*. On voit par ce dernier exemple que les fortes vont avec les fortes, les douces avec les douces.

On verra dans le cours de cette grammaire, quand et comment peuvent et doivent se permuter les lettres mentionnées dans le tableau, ainsi que d'autres qui n'y sont pas mentionnées.

7. La langue algonquine redoute les hiatus ; pour les prévenir, on a coutume d'intercaler des lettres *euphoniques*, mais seulement dans le discours parlé ; car, en écrivant, on fait mieux de ne pas s'en servir.

C'est le plus souvent la voyelle *i* qui est employée comme lettre euphonique.

Ainsi, par exemple, si l'on écrit : " Ka anonak," *celui que j'ai commissionné*, on devra prononcer : " Ka ianonak," afin d'éviter, en parlant, la rencontre des deux *a*. De même on dira : " Kitcitwa Iokanistiwin," au lieu de Kitcitwa Okanistiwin, *la Sainte Eucharistie*, pour ne pas faire heurter *a* contre *o*.

La consonne *n* est quelquefois employée par euphonie entre deux voyelles.

C'est ainsi que plusieurs disent : " mi *n*eta," au lieu de " mi eta," *c'est seulement*. Les autres, en plus grand nombre préfèrent intercaler un *i* et dire : " mi *i*eta."

8. On ne doit pas confondre les lettres euphoniques avec les lettres *unitives* ou *transitives*. Celles-ci servent surtout à la formation des mots composés. Les principales sont *i*, *o* et *w*, exemple :

Asin*i*mikiwam, *maison en pierre*. Mitik*o*makisin, *soulier de bois*, sabot.
Toto*w*canabowack, *herbe à lait*, plante laiteuse.

9. Assez généralement, les grammairiens ont coutume de donner le nom de consonnes liquides aux quatre lettres *l*, *m*, *n*, *r*, " parce que, disent-ils, ces consonnes employées à la suite d'une autre consonne dans une même syllabe, sont *coulantes* et se prononcent aisément."

C'est là assurément ce que ne sauraient admettre nos Indiens de langue algique ; car ils trouvent si peu *coulantes* les syllabes doublées d'une *liquide*, qu'ils se voient contraints de séparer les deux consonnes et d'y intercaler une voyelle *transitive* pour en faciliter la prononciation.

Ainsi, au lieu d'une seule syllabe prétendue *liquide* et plus *coulante*, ils jugent plus commode d'en avoir deux. Voilà pourquoi les Algonquins, les Nipissingues, les Sauteux et autres nations de langue algique, qui n'ont pas la lettre *r* et qui la remplacent par *n*, diront Pananswe, *François*, au lieu de dire simplement *Pnanswe*.

10. En écrivant, les Algonquins n'ont jusqu'ici fait aucun usage des accents ; ces signes ne sont même que très rarement employés dans les livres que les missionnaires ont composés pour l'instruction religieuse de leurs néophytes. Mais ce qui eût été moins utile dans cette sorte d'ouvrages devient indispensable dans une grammaire. Ici, il nous faut absolument marquer les accents et indiquer la manière de s'en servir.

Ainsi, au commencement des mots, il est souvent nécessaire d'employer les accents prosodiques, afin de distinguer les syllabes longues et les syllabes brèves : " wābi," *il voit*, wănicka, *il se lève*.

A la fin des mots, on fait usage tantôt de l'accent grave, tantôt de l'accent circonflexe, et tantôt de l'accent prosodique des syllabes brèves :

O nidjanisà o sakibà ; *Il aime ses enfants.*

Nipoiân, *si je meurs ;* Nipoiăn, *si tu meurs.*

11. Les mots sont *simples* ou *composés*, *primitifs* ou *dérivés*. Les mots simples ne sont pas toujours primitifs ; on leur donne le nom de *racines* quand ils sont primitifs. Les racines algonquines ont rarement plus de deux syllabes et plus de trois consonnes ; il y a même des verbes et des noms qui n'ont qu'une seule lettre radicale. Les mots de trois syllabes et plus sont ou dérivés ou composés. Un mot dérivé est quelquefois plus court que le primitif d'où il dérive.

Ce n'est pas seulement des racines ou de leurs dérivés que se forment les mots composés ; souvent il arrive que des mots composés s'unissent entr'eux pour en former d'autres, ce qui explique l'extrême longueur de certains mots ; en voici un de soixante-huit lettres et de trente-deux syllabes :

Memandawinagwatinikinozawiconiawasakonenindamaganabikonsikegobanenak, *ceux qui autrefois fabriquaient de petits chandeliers d'or d'une merveilleuse apparence.*

12. Ainsi qu'il a été dit ailleurs et qu'on peut le voir en parcourant les colonnes du *Lexique de la langue algonquine*, les racines de cette langue vraiment merveilleuse sont, les unes *fécondes*, les autres *infécondes ;* les unes *primordiales*, les autres *secondaires ;* les unes *isolées*, les autres *agglutinantes ;* les unes *complètes*, les autres *incomplètes*. Ces dernières se subdivisent en trois branches :

Racines *initiales* ou *préfixes :* kin — *pointu ;* Racines *médiales* ou *infixes :* — gi — *peau ;*
Racines *finales* ou *suffixes :* — atin, *montagne.*

13. Il y a en algonquin dix parties du discours, savoir : le nom, l'adjectif, le pronom, le verbe, le participe, la particule verbale, la préposition, l'adverbe, la conjonction et l'interjection.

14. Dans celles des parties du discours qui subissent l'influence des genres, des nombres, des cas, des modes, des temps ou des personnes, il faut avoir soin de distinguer le radical, qui d'ordinaire ne change pas, d'avec la terminaison, qui le plus souvent est variable.

15. A proprement parler, la distinction des genres masculin et féminin n'existe pas dans la langue algonquine, les pronoms *lui* et *elle* s'expriment par un seul et même pronom "win," et le pronom pluriel " winawa " signifie indifféremment *eux* et *elles*. Ainsi, la troisième personne est de commun genre aussi bien que les deux autres :

Aiamie, *il* ou *elle prie ;* Nekamotc, *celui* ou *celle qui chante ;*
Aiamiek, *ils* ou *elles prient ;* Nekamodjik, *ceux* ou *celles qui chantent.*

16. Au lieu de cette institution des genres masculin, féminin et neutre, qui le plus souvent n'est qu'arbitraire et a beaucoup d'inconvénients, comme l'ont déjà fait remarquer d'habiles grammairiens, les Algonquins partagent les êtres en deux grandes classes auxquelles on est convenu de donner le nom de *genre animé* et de *genre inanimé*.

Cette distinction est de la plus haute importance, et sur elle repose toute l'économie de la langue. En effet, on ne saurait ni former le pluriel d'un nom, ni donner ce nom

pour sujet ou pour régime à un verbe, ni former la conjugaison du verbe, sans savoir auparavant si ce nom est du genre animé ou du genre inanimé.

17. Non seulement dans les noms, mais encore dans d'autres parties du discours, c'est la lettre *k* qui sert de marque au pluriel du genre animé, tandis que la lettre *n* désigne celui du genre inanimé, sauf le cas de l'obviatif dont il sera parlé plus loin.

Bornons-nous pour le moment à un petit nombre d'exemples pour montrer cette formation du pluriel soit dans les verbes, soit dans les noms :

Genre animé.		Genre inanimé.	
Okima pindike,	*le chef entre ;*	Pimite pate,	*l'huile est épaisse ;*
Okimak pindikek,	*les chefs entrent ;*	Pimiten paten,	*les huiles sont épaisses ;*
Nind awema akosi,	*ma sœur est malade ;*	Abwi ate,	*l'aviron y est :*
Nind awemak akosik,	*mes sœurs sont malades.*	Abwin aten,	*les avirons y sont.*

18. Au genre animé appartiennent non seulement les êtres qui, de leur nature, ont vie, comme les esprits, les hommes, les animaux, les arbres, les plantes, mais encore plusieurs objets honorés d'un culte religieux, comme croix, médailles, images ; les merveilles du monde sidéral, comme le tonnerre, le soleil, la lune, les étoiles : divers météores, comme la grêle, la neige, la glace ; certains fruits, comme les noix, les prunes, les pommes ; certains grains, comme le blé, le maïs ; plusieurs parties du corps, comme les sourcils, les tempes, les narines, les joues, les genoux, les mollets, les ongles. Sont aussi du genre animé le pain, la farine, les plumes, les peaux, les planches, la pierre à fusil, la gomme, les chaudières, les filets, les raquettes, les mitaines, le calumet, le sommeil, les rêves, les fables.

Les noms du genre inanimé sont ceux qui désignent des choses qui, de leur nature, n'ont point vie, comme le ciel, la terre, l'eau, le feu. Les arbres morts, les plantes desséchées sortent ordinairement du rang des êtres animés pour passer au genre inanimé.

Certains mots appartiennent indifféremment à l'un ou à l'autre genre, et d'autres sont tantôt du genre animé, tantôt du genre inanimé selon les diverses acceptions dans lesquelles ils sont pris.

19. Il ne conviendrait pas de terminer ce chapitre sans faire connaître ce que c'est que l'*obviatif*.

J'ai voulu par ce mot, nouveau dans notre langue, exprimer un phénomène grammatical exclusivement propre aux idiomes algiques. Ce phénomène linguistique affecte et domine, pour ainsi parler, les plus importantes parties du discours ; il offre le précieux avantage de rendre les phrases plus claires et plus faciles et d'en faire disparaître toute trace d'obscurité et d'amphibologie.

Quand dans une phrase se rencontrent deux troisièmes personnes, l'une dépendant de l'autre, ou agissant sur elle, ou recevant d'elle une impression quelconque, cette rencontre, ce concours s'appelle *obviatif*.

Exemples : Le fils de Paul est aimable ; Paul aime son fils ; Paul est aimé de son fils. Dans ces trois phrases, le mot *fils* devra se mettre à l'obviatif.

20. Le *concours* peut se compliquer par l'arrivée d'une nouvelle troisième personne ; dans ce cas, il prend le nom de *sur-obviatif*.

Exemples : Paul aime le fils de Pierre ; Paul est aimé du fils de Pierre. Ici on mettra *Pierre* à l'obviatif, et *son fils* sera mis au sur-obviatif.

Nous allons voir dans le chapitre suivant, la manière de former, dans les noms, soit l'*obviatif* simple, soit le *sur-obviatif*.

Chapitre II. Le nom.

21. Pour former le pluriel des noms, il faut faire attention à la terminaison qu'ils ont au singulier, si c'est par une voyelle qu'ils se terminent ou bien par une consonne. De là les règles suivantes :

a. Aux noms terminés par *a, e, i, o,* on ajoute *k* pour le genre animé, et *n* pour le genre inanimé :

	Singulier.	Pluriel.		Singulier.	Pluriel.
Chef,	Okima,	okimak,	*Argent,*	Conia,	conian,
Ours,	Makwa,	.....k,	*Huile,*	Pimite,	.....n,
Ecrevisse,	Acage,	.....k,	*Mouchoir,*	Mocwe,	.....n,
Pivert,	Meme,	.....k,	*Aviron,*	Abwi,	.....n,
Mouche,	Odji,	.....k,	*Flèche,*	Anwi,	.....n,
Pigeon sauvage,	Omimi,	.....k,	*Fève,*	Sahi,	.....n,
Abeille,	Amo,	.....k,	*Rivière,*	Sipi,	.....n,
Ecureuil,	Atcitamo,	.....k,	*Raclure de peau.*	Wato,	.....n.

b. Aux noms terminés par *g, k, z,* on ajoute *ok* pour le genre animé, et *on* pour le genre inanimé :

	Singulier.	Pluriel.		Singulier.	Pluriel.
Serpent,	Kinebik,	kinebikok,	*Jour,*	Kijik,	kijikon,
Araignée,	Eebik,	..... ok,	*Œil,*	Ckinjik,	.... on,
Chaudière,	Akik,	..... ok,	*Macaque,*	Makak,	.... on,
Etoile,	Anang,	..... ok,	*Feuille,*	Bak,	.... on.
Elan,	Monz,	..... ok,			
Lièvre,	Waboz,	..... ok.			

c. Aux noms terminés par *j, b, p,* on ajoute *ik* pour le genre animé, et *in* pour le genre inanimé :

	Singulier.	Pluriel.		Singulier.	Pluriel.
Orme,	Anib,	anibik,	*Main,*	Nindj,	nindjin,
Sapin,	Cingop,	... ik,	*Veine,*	Miskweiap,	.... in,
Filet,	Asap,	... ik,	*Arc,*	Mitikwab,	.... in,
Ongle,	Ckanj,	... ik,	*Arc-en-ciel,*	Nakweiab,	.... in,
Buis,	Akawanj,	... ik,	*Chevron,*	Apanj,	.... in.

d. Aux noms terminés par *h* on ajoute *iak* pour le genre animé, et *ian* pour le genre inanimé :

	Singulier.	Pluriel.		Singulier.	Pluriel.
Vieillard,	Ikiwenzih,	Ikiwenzihiak,	*Poil de bête,*	Piwaih,	piwaihian,
Vieille,	Mindimonhieh,	.....iak,	*Peau de la tête,*	Nikweih,	..... ian,
Camarade de femme,	Angweh,	..... iak,	*Bouteille,*	Oboteih,	..... ian.
Camarade d'homme,	Tckiweh,	..... iak,			

e. Aux noms terminés par *c, m, n, s, t, w* on ajoute *ak* pour le genre animé, et *an* pour le genre inanimé :

	Singulier.	Pluriel.		Singulier.	Pluriel.
Renard,	Wagoc,	Wagocak,	*Feuille,*	Anibic,	Anibican,
Loup,	Mahingan,	.... ak,	*Maison,*	Mikiwam,	.... an,
Pomme,	Wabimin,	.... ak,	*Champ,*	Kitikan,	.... an,
Poisson,	Kikons,	.... ak,	*Jambe,*	Kat,	.... an,
Neveu,	Ojim,	.... ak,	*Pied,*	Sit,	.... an,
Loup-cervier,	Piciw,	.... ak,	*Œuf,*	Waw,	.... an.

Toutes ces règles ont à souffrir différentes exceptions que l'on fera connaître plus tard.

22. Parmi les noms, il en est qui sont indifféremment du genre animé ou du genre inanimé, par exemple, le chapelet, *aiamie-minak* ou *aiamie-minan*, mot à mot les *grains bénits;* les arcs, *mitikwabik* ou *mitikwabin.*

Quelques-uns, comme "masinaigan", sont tantôt du genre animé, tantôt du genre inanimé, suivant l'acception dans laquelle le mot est pris. Ainsi, on dira "masinaiganak", pour *images, peintures,* et "masinaiganan", pour *papiers, livres, écrits.*

Plusieurs noms ne sont pas employés au pluriel, par exemple, wakwi, le *ciel,* aki, la *terre,* nipi, l'*eau,* ickote, le *feu.* Quelques-uns au contraire ne sont guère employés qu'au pluriel, tels sont le *maïs,* mandaminak; le *foin,* minjackin; le *tonnerre,* onimikik; la *farine,* napaninak; le *sommeil,* wingwak; les *larmes,* sipingon.

23. La distinction des *cas* existe en algonquin; mais, à part le vocatif, les autres cas sont loin de correspondre avec ce que les grammairiens entendent par nominatif, génitif, datif, accusatif et ablatif. On peut distinguer jusqu'à cinq cas dans les noms algonquins, savoir: le nominatif, le vocatif, l'obviatif, le sur-obviatif et le locatif.

a). Le nominatif est la forme la plus simple du mot, et c'est de lui que sont tirés les autres cas. Il s'étend bien plus loin que le nominatif des Latins, comme on va le voir par l'exemple suivant:

Kije Manito sakihigosi,	*Deus est amabilis,*	Ni sakihik Kije Manito,	*Amor a Deo,*
Ni sakiha Kije Manito,	*Amo Deum,*	Ni windamawa Kije Manito,	*Confiteor Deo,*
Kije Manito o Kijewatisiwin,	*Bonitas Dei.*		

Ainsi, en algonquin, c'est partout le nominatif; et ce cas, à lui seul, représente, comme on voit, les cinq cas du latin ci-dessus.

b). Le vocatif singulier est presque toujours semblable au nominatif; mais le vocatif pluriel est toujours différent.

Dans l'état actuel de la langue, il n'y a plus de vocatif singulier que pour les mots "os," *père,* "ga," *mère,* "kwisis," *fils,* "tckiweh," *camarade:*

Nominatif.		Vocatif.	
N'os,	*mon père;*	N'ose,	*mon père!*
Ninga,	*ma mère;*	Ninge,	*ma mère!*
Ningwisis,	*mon fils;*	Ningwise,	*mon fils!*
Nitckiwe,	*mon camarade;*	Ningwi,	*mon camarade!*

Le vocatif pluriel se forme du nominatif singulier en ajoutant *tok*, *itok* ou *otok*, selon la terminaison du mot:

Ainsi de ANJENI, de OCKINAWE on formera: anjenitok, ô anges! ockinawetok, ô jeunes gens!
De KANIS, de NIDJANIS on formera: ni kanisitok, ô mes frères! ni nidjanisitok, ô mes enfants!
De AMIK, de MISAMEK, on formera: amikotok, ô castors! misamekotok, ô baleines!

c). L'obviatif se forme du nominatif en ajoutant *n, an, in, on, ian, wan,* selon la terminaison du mot.

Pour le pluriel, on retranche l'*n*, et la voyelle qui la précède est ordinairement marquée d'un accent grave.

Le verbe qui a pour régime un nom à l'obviatif, prend lui-même la marque de l'obviatif, ainsi on dira :

O papamitawa*n* okima*n*,	*il obéit au chef ;*
O papamitawawà okimà,	*ils obéissent aux chefs ;*
O takomigo*n* kinebiko*n*,	*il est mordu par un serpent ;*
O sakihigo o nikihigo,	*il est aimé de ses parents ;*
O sakiha*n* o kwisisa*n*,	*il aime son fils ;*
O sakihawà o nidjanisiwà,	*ils aiment leurs enfants ;*
Ot anona*n* Kije Manito anjeniwa*n*,	*Dieu envoie un ange ;*
O cawenima*n* ikiwenzihi*an*,	*il a pitié du vieillard.*

d). L'obviatif n'affecte que les noms de genre animé ; le sur-obviatif s'emploie également pour les deux genres, sa forme est *ni*, *ini*, *oni*, selon la terminaison du mot ; elle est la même pour les deux nombres :

Micen o saiensa*n* o wi witikemani nind awema*ni*,	*le frère aîné de Michel veut épouser ma sœur ;*
Sabet a misensa*n* o ki witikemani ki saiensi*ni*,	*la sœur aînée d'Elizabeth a épousé ton frère aîné ;*
Pien o makamani n'osa*n* ot akiko*ni*,	*Pierre enlève la chaudière de mon père ;*
Kije Manito o cingenindamawà anicinabè o patatowini*ni*,	*Dieu déteste les péchés des hommes.*

Le sur-obviatif suppose toujours un obviatif soit exprimé soit sous-entendu : Pon o sakihani o kwisisi*ni*, *Paulus amat filium ejus*, Paul aime son fils, c'est-à-dire le fils d'un autre, par exemple de Jean ; le mot *Janhian* est alors sous-entendu. *Fils* est ici au sur-obviatif, il serait à l'obviatif, si l'affection de Paul avait pour objet son propre fils au lieu du fils de Jean, et l'on dirait : Pon o sakihan o kwisisa*n*, *Paulus amat filium suum.*

e). Le locatif se forme du nominatif en ajoutant *ng*, *ing*, *ong*, selon la terminaison du mot. Il sert à exprimer nos prépositions, *à*, *de*, *par*, *en*, *dans*, *sur*, selon la signification du verbe qui l'accompagne.

Les noms de lieux ne sont guère employés qu'au locatif ; il suffit, à lui seul, pour répondre aux quatre questions *ubi ? quò ? undè ? quà ?* A ces diverses questions : où demeurez-vous ? où allez-vous ? d'où venez-vous ? par où passez-vous ? il suffira, sans qu'il soit nécessaire de répéter le verbe, de répondre par le nom du lieu mis au locatif, comme " Monia*ng*, *Montréal*, Wabitikweia*ng*, *Québec*, Kanactage*ng*, *lac des Deux-Montagnes.*

Le locatif sert encore à exprimer nos adverbes ou locutions adverbiales, *en*, *comme*, *ainsi que*, *en guise de*, *à l'instar de*, *à la façon de :* ikwe*ng* ijiho, *il est habillé en femme ;* kakaki*ng* inwe, *il crie comme un corbeau ;* animoci*ng* ijiminikwe, *il boit à la façon des chiens* ; kinebiko*ng* ijipimote, *il rampe comme un serpent :* pepejikokackwe*ng* ijipato, *il court comme un cheval ;* minikwaganing ot inabadjiton o nindj, *il se sert de sa main en guise de verre.*

Les points cardinaux Waban, l'Est ; Cingapian, l'Ouest ; Kiwetin, le Nord ; Cawan, le Sud, ont leur locatif en *ong :* Wabanong, Cingapianong. Kiwetinong, Cawanong.

Les noms de pays, contrées, provinces, ont un locatif spécial tiré du nom des peuples qui les habitent. La forme de ce locatif est *nang ;* nous l'appelons *locatif régional*, en voici des exemples :

Wemitigojinang, *en France ;* Espanionang, *en Espagne* ; Aganecanang, *en Angleterre ;* Bastonenang, *aux Etats-Unis*, (litt. chez les Bostonnais) ; Natowenang, *chez les Iroquois* ; Odjibwenang, *au pays des Sauteux* ; Otawanang, *au pays des Otawas.*

Pour l'Egypte, la Judée, la Samarie, la Galilée, on dit :

Ejiptenang, Jodenang, Samaninang, Ganinenang.

Il y a encore une autre sorte de locatif que l'on emploie pour marquer un temps passé :

Tibik,	*nuit ;*	Tibikong,	*la nuit dernière,*
Sikwan,	*printemps ;*	Sikwanong,	*le printemps dernier,*
Nibin,	*été ;*	Nibinong,	*l'été dernier,*
Pipon,	*hiver,*	Piponong,	*l'hiver dernier.*

24. La langue algonquine est riche en diminutifs, il y en a non seulement pour les noms, mais encore pour d'autres parties du discours.

La forme du diminutif varie selon la terminaison du mot.

a). Aux noms terminés en *găn*, on se contente d'ajouter *s :*

Masinaigăn,	*livre ;*	Masinaigans,	*petit livre ;*
Packizigăn,	*fusil ;*	Packizigans,	*pistolet ;*
Mahingăn,	*loup ;*	Mahingans,	*louveteau ;*
Opwagăn,	*calumet ;*	Opwagans,	*petit calumet ;*
Pakwejigăn,	*pain ;*	Pakwejigans,	*petit pain.*

b). Aux noms terminés par *ân*, on ajoute *ens :*

Kitikân,	*champ ;*	Kitikanens,	*petit champ ;*
Mokomân,	*couteau ;*	Mokomanens,	*petit couteau ;*
Tcimân,	*canot ;*	Tcimanens,	*petit canot ;*
Mikwân,	*plume ;*	Mikwanens,	*petite plume.*

c). Aux noms terminés par une voyelle, on ajoute *ns :*

Okima,	*chef ;*	okimans,	*petit chef ;*
Inini,	*homme ;*	ininins,	*petit homme ;*
Ikwe,	*femme ;*	ikwens,	*femmelette ;*
Ockinawe,	*jeune homme ;*	ockinawens,	*petit jeune homme.*

d). Aux noms terminés par *b*, *p*, *j*, on ajoute *ins :*

Mitikwab,	*arc ;*	mitikwabins,	*petit arc ;*
Cingop,	*sapin ;*	cingopins,	*petit sapin ;*
Sesap,	*fil ;*	sesapins,	*fil fin ;*
Apanj,	*chevron ;*	apanjins,	*petit chevron.*

e). Aux noms terminés par *g*, *k*, *z*, on ajoute *ons :*

Amik,	*castor ;*	amikons,	*jeune castor ;*
Monz,	*orignal ;*	monzons,	*jeune orignal ;*
Atik,	*bœuf ;*	atikons,	*veau ;*
Waboz,	*lièvre ;*	wabozons,	*levraut.*

f). Aux noms terminés par *c*, *m*, *s*, *w*, on ajoute *ens :*

Wagoc,	*renard ;*	wagocens,	*renardeau ;*
Mikiwam,	*maison ;*	mikiwamens,	*maisonnette ;*
Kokoc,	*cochon ;*	kokocens,	*cochon de lait ;*
Otenaw,	*ville ;*	otenawens,	*village.*

g). Aux noms terminés par *ens*, *ins*, *ons*, on ajoute *ic :*

Kikons,	*poisson ;*	kikonsic,	*petit poisson ;*
Kajakens,	*chat ;*	kajakensic,	*chaton ;*
Awesins,	*bête fauve ;*	awesinsic,	*petite bête fauve ;*
Atikons,	*veau ;*	atikonsic,	*petit veau.*

25. La terminaison *ic* qui s'ajoute aux noms à terminaison diminutive n'indique pas toujours la petitesse ; elle s'emploie le plus souvent pour exprimer la vileté, la chétiveté, la mauvaise qualité, l'état de ruine, de détérioration d'un objet, la laideur, la malignité, la malice, la méchanceté d'une personne ou d'un animal. Souvent on s'en sert pour exprimer un sentiment de mépris, de dédain, de dégoût. Quelquefois, au contraire, c'est une grande marque de tendresse, d'intérêt ou de compassion et de sympathie, On connaît facilement par les circonstances quand il faut prendre en bonne ou en mauvaise part, cette sorte de diminutif auquel nous donnons le nom de détérioratif. Sa forme varie suivant la terminaison du nom :

a). Après une voyelle, c'est *c* ou *wic* :

Manito, manito*c* ;	Abwi, abw*ic*,	anwi, anw*ic* ;
Inini, inini*wic* ;	Ikwe, ikwe*wic*,	sipi, sipi*wic*.

b). Après *t*, c'est *ac*, *ic*, *oc* :

Mackimot*ac*,	*vieux sac ;*	Sit*ac*,	*vilain pied ;*
Bit*ac*,	*mauvaise dent ;*	Anit*ic*,	*vieux dard,*
Wakakwat*oc*,	*mauvaise hache.*		

c). Après *g*, *k*, *z*, c'est *oc* :

Mitik*oc*,	*vieux morceau de bois ;*	Amik*oc*,	*castor de peu de valeur ;*
Monz*oc*,	*orignal au-dessous du commun.*		

d). Après les autres consonnes, c'est *ic* :

Cicib*ic*,	*mauvais canard ;*	Wagoc*ic*,	*méchant renard ;*
Deniband*ic*,	*mauvais ruban ;*	Mikiwam*ic*,	*pauvre maison ;*
Ikiwenzih*ic*,	*vieillard incommode ;*	Akawanj*ic*,	*mauvais buis ;*
Asap*ic*,	*méchant filet ;*	Migos*ic*,	*vieille alène ;*
Waw*ic*,	*œuf gâté.*		

26. Souvent, afin d'exprimer plus fortement le sentiment que l'on éprouve, soit d'antipathie et de répulsion, soit de bienveillance, de tendresse et de sympathie, on redouble la marque du détérioratif, et l'on dit par exemple :

Abw*icic*, ikwe*wicic*, mackimot*acic*, kikang*ocic*, cicib*icic*.

Souvent aussi on change les sifflantes du radical en la chuintante *c* :

Kajakencic, Kikoncic, Kwiwicencic, ikwecencic.

C'est là ce qui s'appelle *ultra-détérioratif*.

27. Les noms sont susceptibles d'un double passé, le passé prochain et le passé éloigné.

La forme du premier est *ban*, *iban*, *oban*, selon la terminaison du nom :

Mani*ban*, Pieni*ban*, Monik*oban*, *Marie*, *Pierre*, *Monique* qui ne sont plus.
N'osiban, *feu mon père*, ni taban, *mon défunt beau-frère*.

Quand on parle de quelqu'un qui est mort et que l'on avait connu, il faut toujours mettre son nom au passé prochain. Mais s'il est question d'une personne décédée depuis

longtemps et que l'on n'a pu connaître, on doit se servir du passé éloigné. La forme de celui-ci est *goban*, *igoban*, *ogoban*, selon la terminaison du nom.

Kaiat pinawigo primatisigwaban Onotaa*goban*, Minensi*goban*, Kisensiko*goban*, autrefois il y a longtemps vivaient *Onotaa*, Minens, Kisensik.

Simon vient de perdre son grand-père, sa grand'mère ; de leur vivant, il les appelait : "ni micomis, n'okomis," mais à présent et tant qu'il vivra, il dira : "ni micomis*iban*, n'okomis*iban*."

Jean est né après la mort de son père, il ne dira jamais *n'os*, ni même *n'osiban*, mais bien "n'osigoban," *mon défunt père que je n'ai pas connu*. En parlant de ses grands-parents morts également avant sa naissance, il dira : "ni micomis*igoban*, n'okomis*igoban*."

28. Les noms algonquins subissent encore d'autres modifications que l'on ne pourrait expliquer clairement avant d'avoir fait connaître les pronoms tant personnels que possessifs. C'est au chapitre du pronom qu'il sera parlé de ce qu'il faut entendre par possessif et interrogatif des noms. Quant au dubitatif, vraie merveille de la langue algonquine, il en sera traité plus loin, à propos du dubitatif dans les verbes.

Chapitre III. L'adjectif.

29. Les Algonquins n'ont qu'un petit nombre d'adjectifs proprement dits. Ces adjectifs se placent toujours devant les noms qu'ils qualifient et sont invariables comme en anglais :

Mino kwiwisens, *un bon petit garçon ;*
Mino kwiwisensak, *de bons petits garçons ;*
Mino ikwesins, *une bonne petite fille ;*
Mino ikwesinsak, *de bonnes petites filles ;*
Matci animoc, *un méchant chien ;*
Matci animocak, *des chiens méchants ;*
Kitci mikiwam, *une grande maison ;*
Kitci mikiwaman, *de grandes maisons ;*
Kwenatc mokoman, *un joli couteau ;*
Kwenatc mokomanan, *de jolis couteaux ;*
Kete masinaigan, *un vieux livre ;*
Kete masinaiganan, *de vieux livres ;*
Ocki akik, *une chaudière neuve ;*
Ocki akikok, *des chaudières neuves ;*
Maia anjeni, *l'ange principal ;*
Maia anjeniwak, *les principaux anges ;*
Inin asin, *une pierre vive* (silex) ;
Inin asinin, *des pierres vives ;*
Maiak ikwe, *une femme étrangère ,*
Maiak ikwewak, *des femmes étrangères ;*
Maiata ikitowin, *une parole blâmable ;*
Maiata ikitowinan, *des paroles blâmables ;*
Kitcitwa Micen, *saint Michel ;*
Kitcitwa Anjeniwak, *les saints anges ;*
Kije inini, *le bonhomme* (pater familias) ;
Kije ikwe, *la bonne femme* (mater familias) ;
Picicik pakwejigan, *du pain sec, rien que du pain ;*
Picicik patakan, *rien que des pommes de terre ;*
Picicik mikiwam, *maison toute seule* (rien dedans).

30. On peut mettre encore au nombre des adjectifs, les mots *nabe* et *nonje*, qui s'emploient pour distinguer le sexe des animaux, par exemple :

Nabe kajakens, *chat*, nonje kajakens, *chatte*.

Le mot *kakike* est quelquefois employé comme adjectif :

Kakike tawin, *l'existence éternelle, l'éternité ;*
Kakike pimatisiwin, *la vie éternelle ;*
Kakike metizowin, *l'éternel brûlement ;*
Kakike ickoteng, *dans le feu éternel.*

L'adverbe *nakawe* peut être considéré comme adjectif dans les expressions suivantes :

Nakawe ickote, *le feu passager ;*
Nakawe metizowin, *le brûlement passage* (*le purgatoire*).

Wiiagi ne se met que devant un nom au pluriel :

Wiiagi pinecinjicak, *divers oiseaux ;*
Wiiagi minan, *différentes graines.*

Nicike s'emploie d'ordinaire après le mot, si c'est un nom ou un pronom :

Cimaganicak nicike, *les soldats seuls ;* Nin nicike, *moi seul ;* win nicike, *lui seul.*

Si le mot qu'il affecte est un verbe, il se met devant :

Nicike tagocin, *il arrive seul ;* Nicike tagocinok, *ils arrivent seuls.*

31. On a vu, dans le chapitre précédent, comment les Algonquins peuvent rendre plusieurs de nos adjectifs, au moyen du diminutif, du détérioratif et des deux passés.

Mais, pour suppléer au petit nombre de leurs adjectifs, leur ressource ordinaire est dans la prodigieuse quantité de leurs verbes.

Voici quelques-uns de ces verbes-adjectifs :

Oniciciw, i, *être bon ;*
Sakihigos, i, *être aimable ;*
Nibwaka, *être sage ;*
Akos, i, *être malade ;*
Aiakos, i, *être maladif ;*
Aiekos, i, *être fatigué ;*
Akikoka, *être enrhumé ;*
Pakate, *être affamé ;*
Nipakwe, *être altéré ;*
Kipiskwe, *être enroué ;*
Cewis, i, *être faible ;*
Animis, i, *être souffrant ;*
Kotakit, o, *être indigent ;*
Cikaw, i, *être veuf ;*
Kika, *être vieux ;*
Kakipice, *être sourd ;*
Kakipingwe, *être aveugle ;*
Tadjise, *être boiteux ;*
Kakitawenindam, *être prudent ;*
Minwenindam, *être content ;*
Gackenindam, *être chagrin ;*
Songis, i, *être fort ;*
Mindit, o, *être gros ;*
Winin, o, *être gras ;*
Songitehe, *être brave ;*
Nipatis, i, *être gourmand :*
Kijewatis, i, *être libéral ;*
Kimotick, i, *être voleur ;*
Minikweck, i, *être ivrogne ;*
Kakipatis, i, *être stupide.*

Les verbes sont ici traduits par l'infinitif, quoique ce mode n'existe pas en algonquin. On verra la raison de cela dans le chapitre des verbes absolus, ainsi que l'explication de la virgule qui figure dans plusieurs des verbes ci-dessus.

32. La distinction des genres masculin et féminin n'existant pas, à proprement parler, en algonquin, il était pourtant nécessaire qu'il y eût dans cette langue quelque manière d'exprimer la distinction des sexes. C'est, en effet, ce qui a lieu, comme on va le voir par les exemples suivants.

a). Termes différents :

Inini, *homme ;*
Ininins, *homunculus ;*
Ikiwenzih, *senex :*
Kwiwisens, *adolescentulus ;*
Ockinawe, *juvenis ;*
Ikwe, *femme ;*
Ikwens, *muliercula ;*
Mindimonhienh, *anus ;*
Ikwesins, *akolescentula ;*
Kikang, *puella, virgo.*

b). Terminaisons différentes du même mot :

Kitci okima, *roi ;*
Anotagan, *serviteur ;*
Kikinohamagewinini, *instituteur ;*
Natowe, *Iroquois ;*
Natowens, *petit Iroquois ;*
Aganecak, *les Anglais ;*
Wemitigojiwak, *les Français ;*
Kitci okimakwe, *reine ;*
Anotaganikwe, *servante ;*
Kikinohamagekwe, *institutrice ;*
Natowekwe, *Iroquoise ;*
Natowekwens, *petite Iroquoise ;*
Aganecakwek, *les Anglaises ;*
Wemitigojikwek, *les Françaises.*

Il est aisé de voir que les terminaisons féminines *kwe*, *kwens* sont tirées des mots ikwe, *femme*, ikwens, *petite femme*.

Ces mêmes terminaisons ajoutées à un nom d'homme se traduisent par *femme de.....*, *fille de.....*

Le brave capitaine Ducharme, un des héros de Chateauguay, s'appelait *Papikodjac*. Madame Ducharme devenait par là même, *Papikodjacikwe*, et les demoiselles avaient chacune le titre de *Papikodjacikwens*.

Nous n'avons plus *Misaki*, c'était le nom du grand chef des Nipissingues; mais nous avons sa veuve, c'est Misakibanikwe, *la femme de feu Misaki :* nous avons ses trois filles, Misakibanikwensak, *les filles de feu Misaki*.

Menjakins est le *fils de Menjaki*, littéralement le *petit Menjaki*. Ce jeune Menjaki se marie, sa femme sera désignée sous le nom de Menjakinsikwe, c'est-à-dire *Madame Menjaki fils*.

c). Dans un chapitre spécialement consacré aux noms de parenté et d'affinité, on verra que les uns sont propres au sexe masculin, d'autres au sexe féminin, d'autres sont communs aux deux sexes, d'autres enfin s'appliquent à l'un ou à l'autre sexe, suivant les circonstances.

d). Quant aux animaux, on en marque le sexe au moyen des mots *nabe*, mâle, *nonje*, femelle :

Nabe kak, *porc-épic mâle ;*
Nabe kajakens, *chat ;*
Nabe manadjenic, *bélier ;*

Nonje kak, *porc-épic femelle ;*
Nonje kajakens, *chatte ;*
Nonje manadjenic, *brebis*.

e). Souvent *nabe* et *nonje* se combinent avec le nom de l'animal de manière à ne former qu'un seul mot :

Nabemik, *castor mâle ;*
Nabetik, *bœuf ;*

Nonjemik, *castor femelle ;*
Nonjetik, *vache*.

Pour *chien* et *chienne*, on dit *nabešim* et *nonjesim :*
Pour *ours*, c'est *nabek*, et pour *ourse*, "nonjek."

f). S'il est question d'oiseaux ou de poissons, les mots *nabe* et *nonje* ne suffisent pas ; il faut y ajouter *se* pour les premiers, et *mek* pour les seconds :

Nabese pakahakwan, *coq ;*
Nabese cicib, *canard ;*
Nabemek kinonje, *brochet mâle ;*

Nonjese pakahakwan, *poule ;*
Nonjese cicib, *cane ;*
Nonjemek name, *esturgeon femelle*.

g). On se sert aussi quelquefois, surtout en style de chasse, des mots "aiabe" et "onidjani," et au diminutif, *aiabens*, *onidjanins :*

Aiabe wawackeci, *broquart ;*
Monz aiabens, *jeune élan mâle ;*

Onidjani wawackeci, *chevrette ;*
Monz onidjanins, *jeune élan femelle*.

Chapitre IV. Le pronom.

33. Nous parlerons successivement des pronoms personnels, des pronoms possessifs, des pronoms démonstratifs, des pronoms interrogatifs, des pronoms relatifs, des pronoms indéfinis, et des pronoms composés.

34. Les pronoms personnels sont de deux sortes, les uns sont *isolés*, les autres *préfixes*.

Il y a trois pronoms personnels préfixes, savoir : *ni*, *ki*, *o*.

Les pronoms personnels isolés, sont au nombre de sept, trois pour le singulier, et quatre pour le pluriel :

Nin, *moi ;* kin, *toi ;* win, *lui ;*
Ninawint } *nous ;* kinawa, *vous* ; winawa, *eux.*
Kinawint }

35. Pour rendre le pronom *nous*, pris *isolément*, les Algonquins se servent tantôt de *kinawint* et tantôt de *ninawint*, selon que la deuxième personne est jointe ou non à la pre-première :

Kin, ka ki gat ijasi, ninanint eta, ningat ijamin, *toi, tu n'iras pas, nous seulement, nous irons.*
Ondas gaie kin, mamawi, ki gat ijamin, kinawint kakina, *viens toi aussi, ensemble nous irons, nous tous.*

Le *kinawint* renferme, comme on voit, la deuxième personne et se nomme pour cela *nous inclusif.*

Le *ninawint* exclut au contraire la deuxième personne, et reçoit en conséquence le nom de *nous exclusif.*

Donnons encore un exemple de cette distinction qui est de la plus haute importance comme on aura occasion de remarquer dans toute la suite de cet ouvrage :

Kakik mikawenimata Jezos i ki nipogobanen kinawint ondji, *souvenons-nous toujours de ce que Jésus est mort pour nous.*

Ki mamoiawamin, ô Jezos, i ki nipoiănbăn ninawint ondji, *je vous remercie, ô Jésus, de ce que vous êtes mort pour nous.*

36. Ces trois petits mots, *ni*, *ki*, *o*, auxquels nous avons donné le nom de *pronoms personnels-préfixes*, suffisent, jusqu'à un certain point, pour rendre nos pronoms français, *je*, *tu*, *il*, *ils*, *elle*, *elles*, *on*, *nous*, *vous*, *me*, *te*, *le*, &c. Le plus souvent même, il suffira d'un seul d'entr'eux pour représenter deux pronoms français, exemples :

Ni wabama,	*je le vois ;*	ni wabamak,	*je les vois ;*
Ki wabam,	*tu me vois ;*	ki wabamin,	*je te vois ;*
Ni wabamik,	*il me voit ;*	ni wabamigok,	*ils me voient ;*
Ni wabamanan,	*nous le voyons ;*	ni wabamananik,	*nous les voyons ;*
Ki wabamawa,	*vous le voyez ;*	ki wabamawak,	*vous les voyez ;*
Ni wabamigonan,	*il nous voit ;*	ni wabamigonanik,	*ils nous voient ;*
Ni wabamigo,	*on me voit ;*	ni wabamigomin,	*on nous voit ;*
Ki wabamigo,	*on te voit ;*	ki wabamigom,	*on vous voit ;*
Ki wabamim,	*tu nous vois ;*	ki wabaminim,	*je vous vois ;*
O wabaman,	*il le voit ;*	o wabamà,	*il les voit ;*
O wabamawan,	*ils le voient ;*	o wabamawà,	*ils les voient ;*
O wabamigon,	*il est vu par lui ;*	o wabamigò,	*il est vu par eux ;*
O wabamigowan,	*ils sont vus par lui ;*	o wabamigowà,	*ils sont vus par eux.*

37. Dans les exemples ci-dessus où figurent les pronoms masculins, *il*, *ils*, *le*, *lui*, *eux*, on peut indifféremment y substituer les pronoms féminins, *elle*, *elles*, *la*, la troisième personne, étant en algonquin, de commun genre, aussi bien que les deux premières, ainsi qu'il a été dit précédemment.

Que l'on remarque aussi que le préfixe *o* ne représente la troisième personne que dans le cas de l'obviatif, c'est-à-dire quand il y a concours de deux troisièmes personnes.

Nous devons encore faire observer que les *nous* marqués ci-dessus sont autant de nous *exclusifs*. Pour les *nous inclusifs*, il n'y aurait qu'à changer le pronom *ni* en *ki :* Ki wabamanan, ki wabamananik, ki wabamigonan, &c.....

38. Les préfixes *ni*, *ki*, *o*, ne remplissent pas seulement le rôle de pronoms personnels ; ils sont encore employés comme pronoms possessifs. Nous venons de les voir placés devant un verbe, nous allons maintenant les placer devant un nom, et alors ils équivaudront à nos possessifs : *mon*, *ma*, *mes*, *ton*, *ta*, *tes*, *notre*, *nos*, *votre*, *vos*, *son*, *sa*, *ses*, *leur*, *leurs* :

Ni nidjanis,	*mon enfant ;*	ni nidjanisak,	*mes enfants ;*
Ki nidjanis,	*ton enfant ;*	ki nidjanisak,	*tes enfants ;*
O nidjanisan,	*son enfant ;*	o nidjanisà,	*ses enfants ;*
Ni / Ki } nidjanisinan,	*notre enfant ;*	ni / ki } nidjanisinanik,	*nos enfants ;*
Ki nidjanisiwa,	*votre enfant ;*	ki nidjanisiwak,	*vos enfants ;*
O nidjanisiwan,	*leur enfant :*	o nidjanisiwà,	*leurs enfants.*

39. Quand le mot commence par une voyelle, *ni* se change en *nind*, *ki* en *kit*, *o* en *ot* :

Nind abwi,	*mon aviron ;*	nind aton,	*je le mets ;*
Kit abwi,	*ton aviron ;*	kit aton,	*tu le mets ;*
Ot abwi,	*son aviron ;*	ot aton,	*il le met.*

Trois noms de parenté font exception à cette règle : au lieu de s'allonger en présence de la voyelle, les préfixes s'élident en tout ou en partie, une apostrophe indique cette élision, ainsi on dira :

N'os,	*mon père ;*	k'os,	*ton père ;*	'osan,	*son père ;*
N'okomis,	*mon aïeule ;*	k'okomis,	*ton aïeule ;*	'okomisan,	*son aïeule ;*
N'ocis,	*mon petit-fils ;*	k'ocis,	*ton petit-fils ;*	'ocisan,	*son petit-fils.*

40. Le préfixe *ni* en présence d'une gutturale ou d'une dentale prend quelquefois une *n* nasale au moyen de laquelle il ne forme plus qu'un seul mot avec le nom, le verbe ou la particule qu'il précède, ainsi on dira :

Ningat ija,	*j'irai ;*	au lieu de	*ni gat ija ;*
Ninga,	*ma mère ;*	au lieu de	*ni ga.*

41. Il faut encore remarquer que cette *n* nasale a le pouvoir de changer les gutturales et les dentales fortes en leurs correspondantes douces, ainsi on dira :

Ningwisis,	*mon fils ;*	au lieu de	*ni kwisis ;*
Ningi ija,	*j'y suis allé ;*	au lieu de	*ni ki ija ;*
Ninda madja,	*je partirais ;*	au lieu de	*ni ta madja ;*
Nindepwetawa Kije Manito,	*je crois en Dieu ;*	au lieu de	*ni tepwetawa.*

42. Le préfixe *o* se transforme en *wi* devant un certain nombre de mots, comme :

Iaw, *corps ;* ias, *chair ;* kanis, *frère ;* ta, *beau-frère ;* nim, *belle-sœur ;* tikik, *sœur ;* tawis, *cousin ;* w, *épouse.*

On a coutume alors de réunir le préfixe au substantif, de manière à ne former qu'un seul mot :

Wiiaw, *son corps ;* wiias, *sa chair ;* wikanisan, *son frère ;* witan, *son beau-frère ;* winimon, *sa belle-sœur* witikikwan, *sa sœur ;* witawisan, *son cousin ;* wiwan, *sa femme.*

43. Les préfixes *ni*, *ki*, *o*, placés devant un nom, équivalent, nous venons de le voir, à nos préfixes nominaux *mon*, *ton*, *son*, *notre*, *votre*, *leur*. Mais il se trouve chez les Algonquins, un certain nombre de noms qui exigent en outre, une marque de possession, marque à laquelle nous donnerons le nom de *possessif*.

La forme du possessif est, selon la terminaison du nom, *m*, *im*, *om* : Les mots " okima," *chef*, atikons, *veau*, tenik, *narine*, requièrent le possessif et vont nous servir d'exemple :

Singulier.	Pluriel.	Singulier.	Pluriel
Nind okima*m*,	Nind okima*m*ak,	Nind atikons*im*inan,	Nind atikons*im*inanik,
Kit okima*m*,	Kit okima*m*ak,	Kit atikons*im*iwa,	Kit atikons*im*iwak,
Ot okima*m*an,	Ot okima*m*à,	Ot atikons*im*iwan.	Ot atikons*im*iwà.
Nind okima*m*inan,	Nind okima*m*inanik,	Ni tenik*om*,	Ni tenik*om*ak,
Kit okima*m*iwa,	Kit okima*m*iwak,	Ki tenik*om*,	Ki tenik*om*ak,
Ot okima*m*iwan.	Ot okima*m*iwà.	O tenik*om*an,	O tenik*om*à,
Nind atikons*im*,	Nind atikons*im*ak,	Ni tenik*om*inan,	Ni tenik*om*inanik,
Kit atikons*im*,	Kit atikons*im*ak,	Ki tenik*om*iwa,	Ki tenik*om*iwak,
Ot atikons*im*an,	Ot atikons*im*à,	O tenik*om*iwan.	O tenik*om*iwà.

44. Non-seulement les noms des personnes et les noms de parenté sont susceptibles de la marque du passé, mais encore tous ceux qui sont précédés d'un des trois préfixes, à quelque genre qu'ils appartiennent.

C'est surtout le passé prochain qui joue un grand rôle dans ce que nous pouvons appeler les *conjugaisons nominales* ; il correspond exactement à l'imparfait des verbes relatifs, et il a une signification très-étendue, comme on peut voir par les exemples suivants :

" Ni masinaiganiban," mon livre qui n'est plus, qui est détruit, perdu; que je n'ai plus, que j'ai donné, vendu, qui m'a été enlevé.

" Ni kitikaniban," mon champ que j'ai abandonné, que je ne cultive plus ; " Nind okimamiban," mon ancien chef, mon ci-devant chef; " Nind awemaban, ma sœur décédée : " Ni taban," celui qui était mon beau-frère, étant marié à ma sœur, et qui, devenu veuf, a convolé à de secondes noces ; " Nind akikoban," ma chaudière d'autrefois, qui me servait autrefois, dont je ne me sers plus ; " Ni tcimaniban," le canot que j'avais et que je n'ai plus.

Que l'on ôte des mots ci-dessus, la marque du passé prochain, et l'on aura " ni masinaigan, ni kitikân, nind okimam, nind awema, ni ta, nind akik, ni tciman," le livre, le champ, le chef, la sœur, le beau-frère, la chaudière, le canot que j'ai maintenant.

45. La conjugaison nominale n'a que deux temps, le présent et le passé. On a vu le présent du mot *nidjanis*, en voici le passé :

Singulier.	Pluriel.	Singulier.	Pluriel.
Ni nidjanisiban,	Ni nidjanisibanek,	Ni nidjanisinaban,	Ni nidjanisinabanek,
Ki nidjanisiban,	Ki nidjanisibanek,	Ki nidjanisiwaban,	Ki nidjanisiwabanek,
O nidjanisibanen,	O nidjanisibanè,	O nidjanisiwabanen,	O nidjanisiwabanè.

On aura bientôt occasion de comparer les conjugaisons nominales aux conjugaisons verbales.

46. Les pronoms préfixes-possessifs français *mon*, *ma*, *mes*, *ton*, *ta*, *tes*, *son*, *sa*, *ses*, &c., se rendent en algonquin par les préfixes *ni*, *ki*, *o* ; c'est ce que l'on vient de voir.

Quant aux pronoms possessifs-isolés, *le mien*, *le tien*, *le sien*, *le nôtre*, *le vôtre*, *le leur*, ils se rendent en algonquin par les pronoms isolés, *nin*, *kin*, *win*, *ninawint*, *kinawint*, *kinawa*, *winawa* :

Nin oca ni mokomanens oom, enh, nin isa, ni nisitawinan, *c'est bien là mon canif, oui, c'est le mien, je le reconnais.*

Kin koni ki mocwem ka mikamân, kin isa, nind inenindam, *c'est peut-être ton mouchoir que j'ai trouvé, c'est le tien, je pense.*

Win ina o wiwakwan oom ? — Enh, win isa, *est-ce là son chapeau ? — Oui, c'est le sien.*

Ninawint isa ni tcimaninan. — Ka mawin, kinawa, *c'est bien notre canot. — Non, ce n'est pas le vôtre.*

Winawa nangwana o tcimaniwa? — Ka ondjita kinawint isa, *est-ce donc leur canot? — Pas du tout, c'est le nôtre.*

Le verbe "ni tibenindan", *j'en suis maître, c'est à moi, cela m'appartient, c'est mien*, s'emploie aussi pour traduire nos pronoms isolés, *le mien, la mienne, les miens*, &c.

Kin tebenindamăn, ganawenindan, nin tebenindamân, ninga ganawenindan, *toi, garde le tien, moi, je garderai le mien.*

47. Les pronoms démonstratifs sont :

Pour le genre animé :		Pour le genre inanimé :	
Aam,	*celui-ci ;*	Oom,	*ceci ;*
Okom,	*ceux-ci ;*	Onom,	*ces choses-ci ;*
Iaam,	*celui-là ;*	Iim,	*cela ;*
Ikim,	*ceux-là.*	Inim,	*ces choses-là.*

C'est le pluriel du genre inanimé qui sert d'obviatif au genre animé, *onom* pour *aam* et *okom ; inim* pour *iaam* et *ikim ;* ainsi que le montrent les exemples suivants :

Kitci nibwaka aam kwiwisens, *ce petit garçon est très intelligent ;* Okom kwiwisensak nibwakak, *ces petits garçons sont intelligents ;* Kikinohamagewinini o mino kikinohamawan onom kwiwisensan, *le Frère instruit bien ce petit garçon ;* O mino kikinohamawâ onom kwiwisensâ, *il instruit bien ces petits garçons ;* Mekatewikonaiewikamikong acaie ki pindike iaam ikwesins, *cette petite fille est enfin entrée au pensionnat des Sœurs ;* Ikim ikwesinsak Moniang dajikek nongom, *ces petites filles résident maintenant à Montréal ;* Mekatewikonaiekwek o kikinohamawawan inim ikwesinsan, *les Sœurs instruisent cette petite fille ;* O kitci sakihawâ inim ikwesinsâ, wewenint o kikinohamawawâ, *elles aiment beaucoup ces petites filles, elles les instruisent comme il faut.*

Voilà pour le g. animé, voici pour le g. inanimé :

Mi oom maninan,	*voici ce que je te donne ;*
Otapinan onom patakan,	*prends ces patates ;*
Mi iim ka minigoiân,	*voilà ce que l'on m'a donné ;*
Inim matci anitciminan ningi webinan,	*j'ai jeté ces mauvais pois.*

48. Quand on parle d'une personne décédée, d'une chose qui n'existe plus, au lieu des pronoms ci-dessus on emploie souvent le pronom *iiam*, qui toujours reste invariable.

Matci awesens o ki amwan iiam ningwisisibanen, *une bête féroce a dévoré ce mien fils qui n'est plus ;*
Iiam ningwisisiban o ki amogon matci awesensibanen, *ce mien fils a été dévoré par une bête féroce ;*
Iiam ni nikihigobanek, *ces miens parents défunts ;*
Mi ondaje ij atekiban iiam mikiwamiban, *voici la place où était cette maison.*

L'emploi de *iiam* suppose toujours un regret de l'objet perdu.

49. Les pronoms interrogatifs sont :

Awenen ? *qui ? quel ? lequel ?* Wekonen ? *quoi ? que ?*

Awenen aam pemosete ?	*quel est celui qui passe ?*
Awenen kin ?	*qui es-tu ?*
Awenen ka pakitehok ?	*qui t'a frappé ?*
Awenen i nijieg ?	*lequel de vous deux ?*
Awenen k'os ?	*qui est ton père ?*
Awenenak ki nikihigok ?	*quels sont tes parents ?*
Wekonen oom ?	*qu'est ceci ?*
Wekonen mesawenindamăn ?	*que désires-tu ?*
Wekonen ondji ?	*à cause de quoi ?*
Wekonen patoieg ?	*qu'est-ce que vous apportez ?*

Quand on veut s'enquérir de l'état, de l'espèce, de la qualité ou condition d'un être quelconque, le nom de cet être suit immédiatement le pronom et en emprunte la terminaison.

Awenen anicinabeNEN ?	*quel homme ?*	c'est-à-dire de quelle nation est-il ?
Awenen abinotcenjiNEN ?	*quel enfant ?*	c'est-à-dire de quel sexe est-il ?
Awenenak atikoNENAK ?	*quelles bêtes bovines ?*	c'est-à-dire sont-ce des bœufs ou des vaches ?
Awenen amikonsiNEN ?	*quel jeune castor ?*	c'est-à-dire est-il mâle ou femelle ?
Wekonen nipiNEN, cominabonEN, pimitenEN ?		*quelle espèce d'eau, de vin, d'huile ?*
Wekonen mitikoNEN ?		*quelle sorte de bois ?*
Wekonenan sahiNENAN ?		*quelle sorte de fèves ?*

50. Les pronoms relatifs *qui*, *que*, se rendent en algonquin par les participes du verbe dont ils sont suivis en français.

Saiakihidjik,	*ceux qui m'aiment ;*	Saiakihakik,	*ceux que j'aime ;*
Saiakihadjik,	*ceux que tu aimes ;*	Saiakihikik,	*ceux qui t'aiment ;*
Saiakihang,	*celui que nous aimons ;*	Saiakihinang,	*celui qui nous aime ;*
Saiakihitidjik,	*ceux qui s'entr'aiment ;*	Saiakihitizodjik,	*ceux qui s'aiment eux-mêmes ;*
Saiakihitizosigok,			*ceux qui ne s'aiment pas eux-mêmes.*

De ces participes et de beaucoup d'autres il sera parlé dans un chapitre spécial.

51. Les principaux pronoms indéfinis sont :

Awiia,	*quelqu'un ;*	kawin awiia,	*personne, aucun ;*
Keko,	*quelque chose ;*	ka keko,	*rien ;*
Nibina,	*plusieurs, beaucoup ;*	nanint,	*quelques-uns ;*
Pejik,	*l'un ;*	kotak,	*l'autre ;*
Kotakak, kotakan,	*d'autres, les autres ;*	kakina,	*tout, tous ;*
Tasin,	*chaque, toutes les fois que ;*	pepejik,	*un à un, un à chaque ;*
Awekwen,	*quiconque ;*	wekotokwen,	*n'importe quoi.*

Pour bien faire comprendre le sens de ces pronoms, nous donnerons plus loin des explications et des exemples qui ne pourraient trouver ici leur place naturelle.

52. Il y a en algonquin trois pronoms composés.

a). Le premier se compose de *ni*, *ki*, *wi*, et des deux consonnes *tc*, qui correspondent exactement à nos syllabes françaises *com*, *con*, *co*, *col*, *cor*, dans les mots "compatriote, confrère, coadjuteur, collaborateur, correspondant ".

La forme de cette sorte de pronoms sera donc *nitc*, *kitc*, *witc*, selon les différentes personnes ; *nitc* pour la première, *kitc* pour la deuxième, *witc* pour la troisième :

Nitc inini,	*mon co-homme, un homme comme moi ;*
Nitc ikwe,	*ma co-femme ;*
Nitc ikwek,	*mes co-femmes ;*
Nitc ikiwenzih,	*un vieillard comme moi ;*
Nitc mindimonhienh,	*ma camarade vieille comme moi ;*
Nitc cimaganicak,	*mes compagnons d'armes ;*
Nitc mekatewikonaiek,	*mes confrères, mes frères dans le sacerdoce ;*
Kitc kwiwisensak,	*les petits garçons de ton âge ;*
Kitc ikwesinsak,	*tes co-petites filles, tes petites compagnes ;*
Kitc anicinabenanik sakihatak,	*aimons nos semblables ;*
Kitc anicinabewak sakihik,	*aimez vos co-personnes humaines, votre prochain ;*
Witc okiman,	*son collègue en charge, un chef de même grade que lui ;*
Witc animocà,	*ses co-chiens, d'autres chiens de son espèce ;*
Witc atikonsà,	*ses co-veaux, des veaux pareils à lui.*

b). La deuxième espèce de pronoms composés se compose des pronoms isolés *nin*, *kin*, *win* et de *itam* qui probablement est dérivé du mot *nitam*, duquel il sera parlé au chapitre des noms de nombre.

Pour former cette sorte de pronoms composés, on ajoute *itam* aux pronoms du singulier, et l'on intercale itam dans ceux du pluriel ; cette intercalation occasionne le changement en *i* de l'*a* de *ninawint* et autres pronoms isolés ; voici à la fois et la formation et la signification de cette sorte de pronoms :

Nin*itam*,	*à mon tour ;*	Kin*itam*,	*à ton tour ;*
Win*itam*,	*à son tour ;*	Nin*itam*iwint, / Kin*itam*iwint,	*à notre tour ;*
Kin*itam*iwa,	*à votre tour ;*	Win*itam*iwa,	*à leur tour.*

c). La troisième espèce de pronoms composés est maintenant moins usitée ; en voici la forme et la valeur :

Ninawawatc,	*moi-même !*	Kinawawatc,	*toi-même !*
Winawawatc,	*lui-même !*	Ninawawatcint, / Kinawawatcint,	*nous-mêmes !*
Kinawawatciwa,	*vous-mêmes !*	Winawawatciwa,	*eux-mêmes !*

Awawatc vient du mot AWATC, *même, voire même,* duquel il sera parlé au chapitre de l'Adverbe.

CHAPITRE V. INTRODUCTION AU VERBE.

53. Le verbe joue un si grand rôle en algonquin, ses formes sont si variées, ses conjugaisons si nombreuses, la matière qu'il offre à l'étudiant est si abondante et si complexe qu'il est absolument nécessaire de lui consacrer plusieurs chapitres, et de partager cette partie du discours en plusieurs divisions.

Avant tout, il faut se rappeler :

a). La très importante distinction du genre animé et du genre inanimé ;
b). La notion non moins importante de la double première personne du pluriel ;
c). L'étonnant effet produit par la rencontre soit de deux, soit de trois troisièmes personnes.

54. Le verbes algonquins se partagent d'abord en deux grandes divisions : verbes absolus et verbes relatifs.

Sous le nom de verbes absolus, nous comprenons :

a). Les verbes neutres, comme *dormir*, *tomber ;*
b). Les verbes actifs sans régime, comme *aimer*, *voir ;*
c). Les verbes passifs sans régime, comme *être aimé*, *être vu ;*
d). Les verbes réfléchis, comme *s'aimer soi-même ;*
e). Les verbes réciproques, comme *s'aimer les uns les autres ;*
f). Les verbes adjectifs, comme *être grand*, *être petit ;*
g). Les verbes numéraux, comme *être dix*, *être cent ;*

h). Les verbes substantifs, comme *être roi, être père ;*
i). Les verbes adverbiaux, comme *être plusieurs, être en petit nombre ;*
j). Les verbes dialogués, comme *je t'aime, tu m'aimes ;*
k). Enfin plusieurs sortes de verbes dérivés de différentes parties du discours.

Sous le nom de verbes relatifs nous comprenons tous les verbes, soit actifs, soit passifs, qui ont actuellement un régime de troisième personne de genre animé ou de genre inanimé, soit au singulier soit au pluriel. De là tout autant de conjugaisons différentes qui sont encore pour la plupart, susceptibles de subdivisions.

55. Après avoir étudié les diverses conjugaisons des verbes absolus et celles non moins nombreuses des verbes relatifs, nous aurons à examiner les verbes unipersonnels, comme : *il neige, il fait froid, il y a beaucoup de maringouins, il y a disette, on se bat, on se réjouit, c'est ouvert, c'est fermé ; la rivière est gelée, il est dimanche, c'est jour de fête, il y a procession*, &c.....

Viendront ensuite les verbes irréguliers et les verbes défectifs, qui, heureusement n'étant pas très nombreux, pourront être réunis dans un seul chapitre.

56. Tous les verbes algonquins peuvent revêtir la forme négative et la forme dubitative, voire même ces deux formes à la fois, ce qui donne naissance à trois nouvelles classes de conjugaisons.

57. Les verbes algonquins ont, généralement parlant, trois modes principaux, savoir : l'indicatif, l'impératif et le subjonctif, et trois modes secondaires, le participe, l'éventuel et le gérondif.

Il sera parlé, dans un chapitre spécial, du participe.

Les modes et les temps des verbes algonquins ne correspondent pas toujours avec ceux des verbes français. On verra la valeur et la forme de ces modes et de ces temps dans les verbes qui seront conjugués ci-après.

L'indicatif, le subjonctif et le participe ont chacun six temps, dont deux simples et quatre composés.

L'impératif a deux temps, le présent et le futur, tous les deux simples.

Il n'y a pas de verbes auxiliaires en algonquin ; c'est à l'aide de certaines particules que se forment les temps composés. Ces particules se placent devant le verbe et se nomment *caractéristiques*.

L'impératif n'ayant pas de temps composé, n'a nul besoin de caractéristique.

L'indicatif a pour caractéristique du passé, la particule *ki ;* celle du futur varie suivant les personnes, c'est *ga* pour les deux premières ; pour la troisième, c'est *kata* dans les verbes absolus, et *ka* dans les verbes relatifs.

Le subjonctif et le participe ont les mêmes caractéristiques ; ce sont : *ka* pour le passé, et *ke* pour le futur.

Le conditionnel existe à la vérité chez les Algonquins ; mais, comme il n'a que des temps composés et que sa forme est la même que celle de l'indicatif, on ne saurait lui donner le titre de *mode*, et on doit plutôt le considérer comme une simple dépendance de l'indicatif, dont il ne se distingue que par sa caractéristique *ta :* ki madjamin, *nous partons ;* ki ta madjamin, *nous partirions.*

La particule *ki*, qui caractérise le passé de l'indicatif, s'associe à la caractéristique du conditionnel pour en former le passé : *ta ki :* ki ki madjamin, *nous sommes partis ;* ki ta ki madjamin, *nous serions partis.* Cette caractéristique du passé prête également son concours pour la formation du futur passé : ki ga madja, *tu partiras ;* ki ga ki madja, *tu seras parti.*

58. Dans ces phrases : "Je prie en marchant, je marche en priant ; tu arrives en chantant, tu chantes en arrivant ; ils partent en pleurant, ils pleurent en partant," le verbe qui est au participe présent doit se mettre en algonquin au présent du subjonctif au moyen de la particule de simultanéité *i* pour les verbes qui commencent par une consonne, *ij* pour ceux qui commencent par une voyelle. Cette particule est exclusivement propre au subjonctif, et elle sert à distinguer ce mode du participe qui jamais ne saurait l'admettre ; voici donc comment on doit traduire les exemples précédents :

Nind aiamia i pimoseiân, ni pimose ij aiamiaiân ;
Madjik i mawiwate ;
Ki tagocin i nikamoiăn, ki nikam i tagocinăn ;
Mawik i madjawate.

Cette particule accompagne ordinairement la conjonction MEGWATC, *lorsque :*

Megwate i pimatisite, *pendant qu'il vit ;*
Megwate i pimatisipan, *pendant qu'il vivait.*

Si dans ce cas on la supprime, il faut la remplacer par l'*augment :*

"Megwate pematisite, megwate pematisipan."

59. On peut dire que l'augment est, comme en grec, tantôt syllabique et tantôt temporel.

L'augment consiste dans un certain changement qui s'opère dans les voyelles, au commencement d'un mot, d'après les règles suivantes :

Si la voyelle initiale est un *a* long, cet *ā* se change en *aia ;*
Si c'est un *a* bref, cet *ă* se change en *e ;*
Si c'est un *e*, cet *e* se change en *aie ;*
Si c'est un *i* long, cet *ī* se change en *a ;*
Si c'est un *i* bref, cet *ĭ* se change en *e ;*
Si c'est un *o* long, cet *ō* se change en *wa ;*
Si c'est un *o* bref, cet *ŏ* se change en *we.*

L'augment ne peut affecter que les temps simples du subjonctif, du participe et de l'éventuel ; le gérondif en est toujours affecté.

60. L'indicatif est le seul mode qui nécessite l'emploi des préfixes personnels *ni, ki, o.*

Pour se distinguer du subjonctif, le participe a souvent besoin de se faire précéder des pronoms personnels isolés *nin, kin, win, ninawint, kinawint, kinawa, winawa.*

Dans les verbes absolus, la troisième personne est toujours dépourvue du signe personnel *o*, et l'on dira sans aucun préfixe : Sakihiwe, *il aime ;* sakiha, *il est aimé ;* sakihitizo, *il s'aime lui-même ;* sakihitiwak, *ils s'entr'aiment.*

Ce n'est que quand il y a rencontre de deux troisièmes personnes, l'une dominant l'autre, qu'apparaît le signe *o ;* ainsi l'on dira : o sakihan, *il l'aime ;* o sakihawan, *ils l'aiment ;* o sakihigon, *il est aimé de lui ;* o sakihigowan, *ils sont aimés de lui.*

C'est, comme on voit, ce qui arrive toujours dans les verbes relatifs, c'est-à-dire dans les verbes à régime de troisième personne, exactement comme dans les conjugaisons nominales, ainsi que l'on a déjà vu : o kwisisan, *son fils ;* ot anisan, *sa fille ;* o nidjanisiwà, *ses enfants.*

Chapitre VI. Verbes absolus.

61. Ainsi qu'il a été dit au chapitre précédent, il y a, en algonquin, plusieurs sortes de verbes absolus ; nous parlerons ici principalement de la première sorte, c'est-à-dire du verbe neutre.

C'est la troisième personne du présent de l'indicatif qui sert comme de racine au verbe neutre, et c'est d'elle que se forme, à une seule exception près [1], tout le reste du verbe.

C'est aussi par cette troisième personne que l'on distingue les différentes conjugaisons des verbes neutres. Elles sont au nombre de trois. Les verbes terminés par une voyelle forment la première conjugaison ; la deuxième conjugaison renferme ceux qui se terminent par *m ;* à la troisième appartiennent ceux dont la racine est en *n.*

62. Les verbes *nese,* il respire ; *pizindam,* il écoute ; *tagocin,* il arrive, serviront de modèles pour conjuguer tous les autres.

Afin d'éviter les longueurs et les redites qui ne font qu'embarrasser et causer du dégoût, nous ne ferons qu'indiquer les temps composés de l'indicatif et nous supprimerons entièrement ceux du subjonctif et des modes qui en dépendent.

Pour le même motif nous ne mentionnerons pas le *nous inclusif* de l'indicatif, attendu que, dans ce mode, il ne diffère de l'*exclusif* que par son préfixe, et qu'il n'y a qu'à mettre *ki* au lieu de *ni* devant la première personne du verbe.

Mais au subjonctif et à l'éventuel, nous avons soin de bien distinguer les deux *nous,* mettant toujour l'*inclusif* au-dessous de l'*exclusif.*

En conjuguant les verbes *nese, pizindam* et *tagocin,* nous n'avons pas cru nécessaire d'y joindre la conjugaison des verbes *respirer, écouter* et *arriver,* aimant mieux laisser à chacun le soin de traduire en sa propre langue les trois verbes algonquins que nous avons choisis pour modèles des verbes neutres et même de la plupart des verbes absolus.

Comme le participe ne diffère du subjonctif que par la troisième personne du pluriel, nous nous sommes bornés à donner cette troisième personne.

Pour éviter une trop grande complication, nous nous sommes abstenus de mentionner, dans notre tableau, le *passé éloigné.* Nous aurons occasion d'en parler ailleurs, et nous comparerons alors le passé éloigné des verbes avec celui des noms dont il a été déjà question.

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[1] On peut voir cette exception, un peu plus loin, No. 63, *c*).

VERBES NEUTRES

		1re conjugaison.	2me conjugaison.	3me conjugaison.
INDICATIF	Présent.	Ni nese, Ki nese, NESE, Ni nesemin, Ki nesem, Nesek.	Ni pizinda*m*, Ki pizinda*m*, [1] PIZINDAM, Ni pizindâmin, Ki pizindâm, Pizindamok.	Ni tagocin, Ki tagocin, TAGOCIN, Ni tagocinomin, Ki tagocinom, Tagocinok.
	Imparfait.	Ni nesenaban, Ki nesenaban, Neseban, Ni nesenanaban, Ki nesenawaban, Nesebanek.	Ni pizindanaban, Ki pizindanaban, Pizindamoban, Ni pizindananaban, Ki pizindanawaban, pizindamobanek.	Ni tagocininaban, Ki tagocininaban, Tagocinoban, Ni tagocininanaban, Ki tagocininawaban, Tagocinobanek,
	Parfait.	Ningi nese, Ki ki nese, Ki nese, Ningi nesemin.	Ningi pizindam, Ki ki pizindam, Ki pizindam, &c....	Ningi tagocin, Ki ki tagocin, Ki tagocin, &c....
	Plus-que-parfait.	Ningi nesenaban, Ki ki nesenaban, Ki neseban, Ningi, &....	Ningi pizindanaban, Ki ki pizindanaban, Ki pizindamoban, &c....	Ningi tagocininaban, Ki ki tagocininaban, Ki tagocinoban, &c....
	Futur.	Ninga nese, Ki ga nese, Kata nese, Ninga nesemin, Ki ga, &c....	Ninga pizindam, Ki ga pizindam, Kata pizindam, Ninga pinzindâmin, &c....	Ninga tagocin, Ki ga tagocin, Kata tagocin, &c....
	Futur passé.	Ninga ki nese, Ki ga ki nese, Kata ki nese, Ninga ki nesemin,	Ninga ki pizindam, Ki ga ki pizindam, Kata ki pizindam, Ninga ki pizindâmin.	Ninga ki tagocin, Ki ga ki tagocin, Kata ki tagocin.
	Conditionnel Présent.	Ninda nese, Ki ta nese, Ta nese, Ninda nesemin, Ki ta nesem, Ta nesek.	Ninda pizindam, Ki ta pizindam, Ta pizindam, Ninda pizindâmin, Ki ta pizindâm, Ta pizindamok.	Ninda tagocin, Ki ta tagocin, Ta tagocin, Ninda tagocinomin, Ki ta tagocinom, Ta tagocinok.
	Conditionnel passé.	Ninda ki nese, Ki ta ki nese, Ta ki nese, Ninda ki nesemin.	Ninda ki pizindam, Ki ta ki pizindam, Ta ki pizindam, Ninda ki pizindâmin.	Ninda ki tagocin, Ki ta ki tagocin, Ta ki tagocin, &c....

[1] Cette lettre finale est mobile, ainsi qu'on pourra le remarquer par toute la suite de cette 2me conjugaison.

		1. Conj.	2. Conj.	3. Conj.
Subjonctif	Présent.	Neseiân, Neseiăn, Nesete, Neseiâng, Neseiăng, Neseieg, Nesewate	Pizindamân, Pizindamăn, Pizindang, Pizindamâng, Pizindamăng, Pizindameg, Pizindamowate.	Tagocinân, Tagocinăn, Tagocing, Tagocinâng, Tagocinăng, Tagocineg, Tagocinowate.
	Passé.	Neseiânbân, Neseiănbăn, Nesepan, Neseiangiban, Neseiangoban, Neseiegoban, Nesewapan.	Pizindamânbân, Pizindamănbăn, Pizindangiban, Pizindamangiban, Pizindamangoban, Pizindamegoban, Pizindamowapan.	Tagocinânbân, Tagocinănbăn, Tagocingiban, Tagocinangiban, Tagocinangoban, Tagocinegoban, Tagocinowapan.
Eventuel	Présent.	Naieseiânin, Naieseiănin, Naiesedjin, Naieseiangin, Naieseiangon, Naieseiegon, Naiesewadjin.	Pezindamânin, Pezindamănin, Pezindangin, Pezindamangin, Pezindamangon, Pezindamegon, Pezindamowadjin.	Tegocinânin, Tegocinănin, Tegocingin, Tegocinangin, Tegocinangon, Tegocinegon, Tegocinowadjin.
Gérondif Participe	Présent. Passé.	Naiesedjik, Naiesepanek.	Pezindangik, Pezindangibanek.	Tegocingik, Tegocingibanek.
	[1]	Naiesengin.	Pezindamongin.	Tegocinongin.
Impératif	Présent.	Nesen, Neseta, Nesek.	Pizindan, Pizindanda, Pizindamok.	Tagocinin, Tagocinda, Tagocinok.
	Futur.	Nesekan, Nesekang, Nesekeg.	Pizindamokan, Pizindamokang, Pizindamokeg.	Tagocinokan, Tagocinokang, Tagocinokeg.

63. D'après les modèles ci-dessus on pourra conjuguer les verbes suivants :

1. conj.		2. conj.		3. conj.	
Kika,	*être vieux ;*	Ososotam,	*tousser ;*	Pangicin,	*tomber ;*
Kiwe,	*s'en retourner ;*	Anwetam,	*refuser ;*	Cingicin,	*être couché ;*
Koki,	*plonger ;*	Nakwetam,	*répondre ;*	Twacin,	*enfoncer, caler ;*
Pimipato,	*courir ;*	Pamitam,	*obéir ;*	Onzamiton,	*bavarder.*

[1] Le gérondif est un mode invariable et qui s'applique à tous les temps et aux deux nombres.

64. Sur les verbes de la première colonne, il y a plusieurs remarques à faire.

a) Plusieurs sont imparisyllabiques, c'est-à-dire n'ont pas le même nombre de syllabes aux personnes du singulier du présent de l'indicatif; la troisième personne seule se termine par une voyelle.

Ni pap,	*je ris ;*	Ni maw,	*je pleure ;*	Ni nip,	*je meurs ;*
Ki pap,	*tu ris ;*	Ki maw,	*tu pleures ;*	Ki nip,	*tu meurs ;*
papi,	*il rit ;*	mawi,	*il pleure ;*	nipo,	*il meurt.*

Ces sortes de verbes sont marqués, dans le dictionnaire, de cette manière :

Pap, i,	*rire ;*	maw, i,	*pleurer ;*	Nip, o,	*mourir ;*
Nikam, o,	*chanter ;*	Nim, i,	*danser ;*	Nik, i,	*naître ;*
Pimatis, i,	*vivre ;*	Akos, i,	*être malade ;*	Sik, o,	*cracher.*

b) Parmi les verbes imparisyllabiques, quelques-uns adoucissent leur consonne finale, à la troisième personne :

Nind awas,	*je me chauffe ;*	Nind opinik,	*j'ai la crampe ;*
Kit awas,	*tu te chauffes ;*	Kit opinik,	*tu as la crampe ;*
awazo,	*il se chauffe ;*	opinigo,	*il a la crampe.*

Le dictionnaire marque ces verbes ainsi qu'il suit :

Awa*s*, o,	*se chauffer ;*	Opini*k*, o,	*avoir la crampe ;*
Anwenindi*s*, o,	*se repentir ;*	Amo*k*, o,	*avoir un cancer ;*
Abwe*s*, o,	*suer ;*	Pimipai*k*, o,	*aller à cheval.*

c) Un certain nombre de verbes n'ont pas la même voyelle finale à toutes les personnes :

Ni kapa,	*je débarque ;*	Ni nipa,	*je dors ;*
Ki kapa,	*tu débarques ;*	Ki nipa,	*tu dors ;*
kape,	*il débarque ;*	nipe,	*il dort.*

Pour ces verbes, la racine doit être prise dans les premières personnes plutôt que dans la troisième : " ni kapamin, ni nipamin ", et non pas *ni kapemin, ni nipemin,* nous débarquons, nous dormons.

Dans le dictionnaire on marque ainsi ces sortes de verbes :

Kap*a*, *e*,	*débarquer ;*	Nip*a*, *e*,	*dormir ;*
Madj*a*, *i*,	*partir ;*	Mijak*a*, *e*,	*aborder, prendre terre ;*
Aiami*a*, *e*,	*prier ;*	Ij*a*, *i*,	*aller.*

Par exception, à l'indicatif les troisièmes personnes gardent la voyelle finale de la racine ordinaire du verbe. Ainsi on dira : " aiamiek ", *ils prient,* aiamiebanek, *ils priaient.*

Ainsi encore se forment les noms verbaux : aiamiewin, *la prière ;* kapewin, *le débarquement.*

65. Souvent on abrège la caractéristique *kata,* et l'on se contente de dire *ta,* ce qui offre l'inconvénient d'exposer à confondre la troisième personne du futur avec celle du conditionnel.

Mais du moins, aucune confusion de ce genre n'est à craindre dans les verbes relatifs, où nous verrons que la caractéristique du futur de l'indicatif est toujours *ka* pour la troisième personne.

66. A l'impératif, nous ne mettons et nous avons raison de ne mettre que trois personnes, savoir : la deuxième du singulier et les deux premières du pluriel. L'impératif algonquin n'a pas de troisième personne. On verra plus loin comment on doit y suppléer au moyen de différents autres modes.

Le futur de l'impératif se forme de la racine du verbe en ajoutant *kan, kang, keg,* pour la première conjugaison, *okan, okang, okeg* pour les deux autres.

Pizindan, *audi nunc ;* pizindamokan, *audito tunc.*

Pizindamok, *audite ;* pizindamokeg, *auditote.*

67. Ce ne sera qu'au *chapitre du participe* que nous pourrons faire connaître comme il faut, l'emploi du gérondif.

68. L'*m* de la deuxième conjugaison tantôt se supprime : ni pizindanaban, *j'écoutais ;* tantôt se change en *n :* " pizindang ", *s'il écoute ;* tantôt enfin se confond avec l'*m* des désinences plurielles — *min*, — *m*. Dans ce dernier cas, un accent circonflexe sur l'*a* qui précède, vient avertir qu'il faut le prononcer *long :* " ni pizindâmin ", *nous écoutons ;* " ki pizindâm ", *vous écoutez.*

Chapitre VII. Verbes relatifs.

69. Nous nous bornerons dans ce chapitre aux verbes actifs à régime animé. Montrons d'abord qu'ils se rattachent aux verbes neutres au moyen de la troisième personne des verbes passifs absolus.

Verbe neutre.		Verbe passif.	
Nibwaka,	*il est sage ;*	Sakiha,	*il est aimé ;*
Nibwakak,	*ils sont sages ;*	Sakihak,	*ils sont aimés ;*
Nibwakaban,	*il était sage ;*	Sakihaban,	*il était aimé ;*
Nibwakabanek,	*ils étaient sages ;*	Sakihabanek,	*ils étaient aimés.*

Que l'on mette à présent les préfixes *ni* et *ki* devant cette troisième personne du verbe passif-absolu, et nous aurons le verbe relatif-actif :

Ni sakiha,	*je l'aime ;*	Ni sakihak,	*je les aime ;*
Ki sakiha,	*tu l'aimes ;*	Ki sakihak,	*tu les aimes ;*
Ni sakihaban,	*je l'aimais ;*	Ni sakihabanek,	*je les aimais ;*
Ki sakihaban,	*tu l'aimais ;*	Ki sakihabanek,	*tu les aimais.*

On peut faire de même avec les autres verbes :

Pasanjewa,	*il est puni ;*	Pakitewa,	*il est frappé ;*
Wabama,	*il est vu ;*	Amwa,	*il est mangé ;*
Nondawa,	*il est entendu ;*	Pizindawa,	*il est écouté ;*
Kitciwawina,	*il est louangé ;*	Manenima,	*il est méprisé ;*
Pindikana.	*il est introduit ;*	Sakidjiwebina,	*il est mis dehors.*

70. Comme la deuxième personne singulier du présent de l'impératif nous offre le verbe actif sous sa forme la plus simple, c'est d'elle qu'il paraît plus naturel de tirer tout le reste du verbe.

A l'exception des deuxièmes personnes du présent de l'impératif, et des troisièmes du subjonctif, toutes les autres personnes du verbe ont des désinences différentes, selon que le régime est au singulier ou au pluriel. De là une double conjugaison :

Impératif

Présent.

Takon,	*saisis-le ;*	Takon,	*saisis-les ;*
Takonata,	*saisissons-le ;*	Takonatak,	*saisissons-les ;*
Takonik,	*saisissez-le ;*	Takonik,	*saisissez-les.*

Futur.

Takon*akan*,	*saisis-le ;*	Takon*akatwak*,	*saisis-les ;*
Takon*akang*,	*&c....*	Takon*akangwak*,	*&c....*
Takon*akeg*,		Takon*akegwak*,	

INDICATIF

Présent.

Ni takon*a*,	*je le saisis ;*	Ni takon*ak*,	*je les saisis ;*
Ki takon*a*,	*&c....*	Ki takon*ak*,	*&c....*
O takon*an*,		O takon*à*,	
Ni takon*anan*,		Ni takon*ananik*,	
Ki takon*awa*,		Ki takon*awak*,	
O takon*awan*,		O takon*awà*,	

Imparfait.

Ni takon*aban*,	*je le saisissais ;*	Ni takon*abanek*,	*je les saisissais ;*
Ki takon*aban*,	*&c....*	Ki takon*abanek*,	*&c....*
O takon*abanen*,		O takon*abanè*,	
Ni takon*anaban*,		Ni takon*anabanek*,	
Ki takon*awaban*,		Ki takon*awabanek*,	
O takon*awabanen*,		O takon*awabanè*,	

SUBJONCTIF

Présent.

Takon*ak*,	*si je le saisis ;*	Takon*akwa*,	*si je les saisis ;*
Takon*ătc*,		Takon*atwa*,	*&c....*
Takon*âtc*,	*&c....*	Takon*âtc*,	
Takon*angitc*,		Takon*angitwa*,	
Takon*ang*,		Takon*angwa*,	
Takon*eg*,		Takon*egwa*,	
Takon*awatc*,		Takon*awatc*.	

Imparfait.

Takon*akiban*,	*si je le saisissais ;*	Takon*akwaban*,	*si je les saisissais ;*
Takon*atiban*,	*&c....*	Takon*atwaban*,	*&c....*
Takon*apan*,		Takon*apan*,	
Takon*angiban*,		Takon*angitwaban*,	
Takon*angoban*,		Takon*angwaban*,	
Takon*egoban*,		Takon*egwaban*,	
Takon*awapan*,		Takon*awapan*,	

EVENTUEL.

Tekonakin,	*quand je le saisis ;*	Tekonakwan,	*quand je les saisis ;*
Tekonădjin,	*&c....*	Tekonatwan,	*&c....*
Tekonâdjin,		Tekonâdjin,	
Tekonangidjin,		Tekonangitwan,	
Tekonangon,		Tekonangwan,	
Tekonegon,		Tekonegwan,	
Tekonawadjin,		Tekonawadjin,	

Nous ferons connaître l'emploi de l'éventuel dans le chapitre du participe. C'est là aussi que nous parlerons des participes des verbes relatifs, matière trop abondante et trop compliquée pour être traitée ici d'une manière convenable. Quant au gérondif, ce mode n'existe pas dans les conjugaisons des verbes à régime soit actifs, soit passifs.

71. Nous n'avons mis ici que les temps simples ; il eût été superflu d'y joindre les temps composés, et il suffira de se rappeler qu'au futur de l'indicatif on doit remplacer la caractéristique *kata* par *ka :*

O ka takonan,	*il le saisira ;*	O ka takonà,	*il les saisira ;*
O ka takonawan,	*ils le saisiront ;*	O ka takonawà,	*ils les saisiront.*

72. Sur *takon* on pourra s'exercer à conjuguer les verbes suivants :

Sakih,	*aime-le ;*	Moh,	*fais-le pleurer ;*
Wabam,	*vois-le ;*	Nipeh,	*endors-le ;*
Pamitaw,	*obéis-lui ;*	Nanzikaw,	*va le trouver ;*
Ganawenim,	*garde-le ;*	Pindikaw,	*entre chez lui ;*
Windamaw,	*dis-le-lui ;*	Pakitin,	*lâche-le ;*
Kakanzom,	*exhorte-le ;*	Webin,	*jette-le ;*
Pizindaw,	*écoute-le ;*	Tipakon,	*juge-le ;*
Kikinoamaw,	*instruis-le ;*	Kijikaw,	*paye-le.*

73. Certains verbes offrent dans leur racine une certaine particularité, savoir :

a) Les verbes en *j*, comme :

Kaj,	*cache-le ;*	Nagaj,	*abandonne-le ;*
Mij,	*donne-lui ;*	Pij,	*amène-le ;*
Anoj,	*emploie-le ;*	Ganoj,	*parle-lui.*

Ce *j* final se change en *n* dans toute la conjugaison active.

b) Les verbes en *ci*, comme :

Aci,	*mets-le ;*	Nici,	*tue-le ;*
Goci,	*crains-le ;*	Mawatici,	*fais-lui visite.*

Dans ces verbes *ci* se change partout en *s*.

c) Les verbes en *v*, comme :

Pakitev,	*frappe-le ;*	Pasanjev,	*punis-le ;*
Pajipav,	*darde-le ;*	Ikonajav,	*enlève-le.*

Ce *v* devient *w* dans toute la conjugaison active.

Chapitre VIII. Verbes à régime inanimé.

74. Dans tous ces verbes, la deuxième personne du présent de l'impératif est toujours semblable aux trois personnes du singulier du présent de l'indicatif, et c'est de cette personne que se forme tout le reste du verbe.

Nous diviserons les verbes à régime inanimé en deux conjugaisons ; à la première conjugaison appartiennent les verbes terminés en *on*, *en*, *in* ; Sakiton, *aime-le ;* minikwen, *bois-le ;* midjin, *mange-le.* Les verbes terminés en *an* sont de la seconde : Takonan, *saisis-le ;* wabandan, *vois-le ;* gotan, *crains-le ;* pizindan, *écoute-le.*

75. Pour l'ordinaire, tous ces verbes se tirent de la racine du verbe actif à régime animé, et on les trouve au dictionnaire marqués de cette manière :

Sakih / Sakiton } *aime le,*	Aci / Aton } *mets-le,*	Pij / Piton } *apporte-le,*	Kaj / Katon } *cache-le,*
Webin / Webinan } *jette-le,*	Takon / Takonan } *saisis-le,*	Goci / Gotan } *crains-le,*	Wabam / Wabandan } *vois-le.*

76. Les verbes en *en* et en *in* sont très peu nombreux, et se tirent pour l'ordinaire de la

racine du verbe neutre. Ainsi de " minikwe", *il boit*, on formera le verbe actif " minikwen : " " totocanabo o minikwen ", *il boit du lait ;* du verbe neutre AGWI, on formera l'actif " nind agwin, kit agwin, ot agwin ".

Le verbe MIDJIN fait bande à part, et ne dérive d'aucun autre verbe.

77. Il y a fort peu de différence entre les conjugaisons des verbes absolus et celles des verbes à régime inanimé. On s'en convaincra aisément en comparant les verbes *nese* et *pizindam* avec les verbes *sakiton* et *pizindan*, qui vont servir de modèle pour la conjugaison des verbes à régime inanimé.

La lettre *n* qui termine ces verbes est purement servile et ne fait point partie du radical qui partout est *sakito* et *pizinda*. Nous avons soin de bien distinguer le radical d'avec les diverses terminaisons du singulier d'abord, et puis du pluriel, quand le pluriel en a qui lui sont propres.

IMPÉRATIF

Présent.

1. conj.	2. conj.
Sakito*n*,	pizinda*n*,
Sakito*ta*, *tan*	pizinda*nda*, *ndan*
Sakito*k*,	pizinda*mok*,

Futur.

Sakito*kan*, *katwan*	pizinda*mokan*, *mokatwan*
Sakito*kang*, *kangwan*	pizinda*mokang*, *mokangwan*
Sakito*keg*, *kegwan*	pizinda*mokeg*, *mokegwan*

INDICATIF

Présent.

Ni sakito*n*, *nan*	Ni pizinda*n*, *nan*
Ki sakito*n*, *nan*	Ki pizinda*n*, *nan*
O sakito*n*, *nan*	O pizinda*n*, *nan*
Ni sakito*nanan*, [1] *nanân*	Ni pizinda*nanan*, [1] *nanân*
Ki sakito*naSa*, *nawan*	Ki pizinda*nawa*, *nawan*
O sakito*nawa*, *nawan*	O pizinda*nawa*, *nawan*

Imparfait.

Ni sakito*naban*, *nabanen*	Ni pizinda*naban*, *nabanen*
Ki sakito*naban*, *nabanen*	Ki pizinda*naban*, *nabanen*
O sakito*naban*, *nabanen*	O pizinda*naban*, *nabanen*
Ni sakito*nanaban*, *nanabanen*	Ni pizinda*nanaban*, *nanabanen*
Ki sakito*nawaban*, *nawabanen*	Ki pizinda*nawaban*, *nawabanen*
O sakito*nawaban*, *nawabanen*	O pizinda*nawaban*, *nawabanen*.

SUBJONCTIF

Présent.

Sakito*iân*,	Pizinda*mân*,
Sakito*iăn*,	Pizinda*măn*,
Sakito*ic*,	Pizinda*ng*,
Sakito*iâng*,	Pizinda*mâng*,
Sakito*iăng*,	Pizinda*măng*,
Sakito*ieg*,	Pizinda*meg*,
Sakito*watc*,	Pizinda*mowatc*.

[1] *Nanân* est une contraction de *nananin*, terminaison qui serait fort peu agréable à l'oreille, surtout dans certains verbes qui donneraient encore un *na* de plus : " ni takonananananin, ni webinananananin ".

Imparfait.

Sakito*iânbân*,	Pizinda*mânbân*,
Sakito*iănbăn*,	Pizinda*mănbăn*,
Sakito*pan*,	Pizinda*ngiban*,
Sakito*iangiban*,	Pizinda*mangiban*,
Sakito*iangoban*,	Pizinda*mangoban*,
Sakito*iegoban*,	Pizinda*megoban*,
Sakito*wapan*,	Pizinda*mowapan*.

78. Sur Sakiton on peut conjuguer les verbes suivants :

Aton,	*mets-le, dépose-le ;*	Minikwen,	*bois-en ;*
Apagiton,	*jette-le, lance-le ;*	Apandjiken,	*assaisonne-le avec ;*
Angoton,	*détruis-le ;*	Agwin,	*habille-toi avec ;*
Katon,	*cache-le ;*	Midjin,	*manges-en.*

Sur Pizindan on conjuguera :

Takonan,	*saisis-le ;*	Mitonenindan,	*pensces-y ;*
Pakitinan,	*abandonne-le ;*	Ganawenindan,	*garde-le ;*
Webinan,	*rejette-le ;*	Otitan,	*approches-en ;*
Otapinan,	*prends-le ;*	Gotan,	*redoute-le ;*
Wabandan,	*vois-le ;*	Pakitehan,	*frappe-le ;*
Kijikabandan,	*regarde-le ;*	Ipinehan,	*paye-le tant.*

A continuer.

ROYAL SOCIETY OF CANADA

TRANSACTIONS

SECTION II.

ENGLISH LITERATURE, HISTORY, ARCHÆOLOGY, ETC.

PAPERS FOR 1891.

I.—*Notes on the Shuswap People of British Columbia.*

By GEORGE M. DAWSON, LL.D., F.R.S., *Assistant Director Geological Survey of Canada.*

(Read May 27, 1891.)

The notes and observations here presented have been made at different times by the writer, while engaged in geological work in the southern inland portion of British Columbia, during the years 1877, 1888, 1889 and 1890. The work in hand did not admit of any special or systematic study of the Indians, but almost constant association with these people naturally afforded numerous opportunities of acquiring information respecting them, and the circumstances were such as to favour especially the accumulation of local notes and the identification of places. The information thus gathered, is here presented explicitly and for the most part without comment or attempt at explanation or correlation. The writer ventures to hope that this record of observations may be accepted as a useful contribution to the knowledge of the ethnology of the region, and as one which may be of service in future investigations, though in itself possessed of no high scientific value.

It will be understood that these notes make no pretence to completeness, and that while some matters are referred to at considerable length, other aspects of the life of the people, upon which it has happened that nothing of apparent value was obtained, are passed over in silence.

It must further be mentioned that Dr. Franz Boas, who has for some years been engaged in the investigation of the ethnology of British Columbia, for the Committee of the British Association for the Advancement of Science on the Northwestern Tribes of Canada, has recently prepared a short report on the Shuswaps. This is embodied in the sixth report of the Committee (pp. 80-95), lately printed, and some subjects fully dealt with therein are here altogether omitted. Neither is any attempt here made to deal with the language, in its several dialects. A vocabulary of the Stā′-tlum-ooh or Lillooet has already been published in the "Composition Vocabularies of the Indian Tribes of British Columbia" (1884), by the writer and the late Dr. Tolmie, while short vocabularies, with some notes on the grammar, are given by Dr. Boas in the work above cited, and it is understood that the same author is engaged in a further study of this and allied languages.

The latter part of the present paper consists of a list of place-names in the Shuswap country. The positions of most of these places have been accurately identified on the ground, while the names themselves have been obtained from Indians with local knowledge and employed from time to time as guides or in other capacities. The maps at present in existence are, however, so inexact in detail, that it is often difficult to clearly localize on them the points to which the names apply. This difficulty will be removed for a certain part of the region on the publication of the Kamloops sheet of the geological map, now in the hands of the engraver. The names of places occurring within the area of this map are

therefore separately catalogued, in such a way as to be easily identified on it. Places beyond the limits of the map in question, are so described as to enable them to be recognized either on existing maps or on the ground.

The meanings given for the Indian names of places are such as I was able to obtain, but may not in all cases be accurate. In many instances the Indians themselves do not know what the names mean, and in others it was found difficult to understand the explanations given by them.

I am indebted to Mr. J. W. Mackay, Indian agent at Kamloops, for several interesting contributions, which will be found embodied in the following pages; also for his courtesy in replying to many questions which have occurred in the course of the preparation of the matter for this paper.

The orthography here employed in rendering the native names, is identical with that previously adopted by the writer in his "Notes and Observations on the Kwakiool People" ('Trans. Royal Soc. Can.,' vol. v) and in other papers.

The name Shuswap, the usual anglicised form of Shoo-whā'-pa-mooh,[1] that of a tribal division, is in this paper employed to designate all the Salish people of the southern inland portion of British Columbia, bounded on the east by the Kootenuha, on the north by the Tinneh, and westward by various tribes of the Lower Fraser and coast. It is inconvenient to designate the people collectively as the Salish of British Columbia, as the Salish affinities of several tribes on the side of the coast have now been clearly shown.

Tribal Subdivisions.

The name of the Shuswaps for themselves, or for Indians in general as distinguished from other peoples, is *Koo'-li-mooh*, "the people," or, perhaps more strictly, "mankind." They are divided into numerous village-communities, of which a number, though by no means a complete list, is given on a later page. The existence of many small dependent villages or hamlets with names of their own, renders it very difficult to make a satisfactory enumeration of the numerous septs. Superior to these, however, five principal divisions, depending on differences of dialect, and recognized as such by the natives themselves, exist among the people of Salish stock in British Columbia. These are given below, together with some notes on the limits of each, which, however, are to be regarded merely as in further explanation of the map upon which the boundaries are drawn. These boundaries nearly correspond with those given by Dr. Boas on the map accompanying his report, but the scale of that map is too small and the geographical features too indeterminate to enable the sub-divisions to be shown with precision. On the earlier map which accompanies the "Comparative Vocabularies of the Indian Tribes of British Columbia" no attempt was made to show the precise lines of division.

1. *Shoo-whā'-pa-mooh* (*Sū'-Quapma*Q, Boas; *Se-huapm-uh*, Mackay.) These are the Shuswaps proper, from whom the name here applied to the group of related tribes is

[1] *Sushwap*, as written by Mr. Mackay, is, as he urges, no doubt nearer to the true pronunciation. *Shushwap* as employed by Dr. Boas in the heading of his article above cited, is yet another variant. As, however, none of these forms can lay claim to accuracy, and the name is here employed merely as a general designation, I do not feel justified in adding to the confusion which already exists in the matter by changing the orthography long established on the maps.

derived. The people of this tribe and speaking an identical dialect, possess the largest territory, which includes the Shuswap Lakes and Adams Lake, the valleys of the South and North Thompson Rivers, and nominally extends northward to Quesnel Lake, though so few Indians inhabit or hunt in that region that it is difficult there to fix the limit exactly. The furthest northern point on the Fraser reached by the Shoo-whā′-pa-mooh, is in the vicinity of Soda Creek; but to the south of the Chilcotin River their country extends to the west of the Fraser, of which river they claim both sides as far down as, and including, the village of *Kwī-kwē-a-kwēt′* (Bob's village), situated nine miles below Big Bar Creek. They thus spread westward to the north of the Lillooets, and are the only people of the Shuswap tribes whose boundary marches with that of the Tinneh. The country about Clinton and the valley of Hat Creek is part of their territory, including the village of *Skwai′-luh*, on Pavilion Creek. To the south they are bounded by the Thompsons and Okanagans. They extend nearly to Ashcroft, on the Thompson River, but do not include the *Stlahl* village there, which is Thompson. Eastward, the boundary runs thence nearly along the watershed between the Nicola and Thompson, but Trout Lake, at the head of one branch of Guichon Creek, is claimed by the Shoo-whā′-pa-mooh. Grande Prairie belongs to the Okanagans, but all the lower part of the Salmon River, with the Spallumsheen valley nearly as far south as the head of Okanagan Lake, is Shoo-whā′-pa-mooh country.

A small isolated band of Shoo-whā′-pa-mooh is situated near the head of the Columbia River, in the midst of the Kootenaha country, as indicated on the map accompanying the "Comparative Vocabularies." According to notes supplied by Mr. J. W. Mackay, this band emigrated thither about forty years ago, from the North Thompson; following a route which reaches the Columbia near the mouth of Canoe River. The emigrants there made friends with some Stoney Indians who were in the habit of crossing the Rocky Mountains by the Howse Pass, for the purpose of taking salmon in the Columbia. Supported by these allies, the Shoo-whā-pa-mooh colonists were able to hold their own till the influx of the whites occurred and prevented further overt acts against them.

The Shoo-whā′-pa-mooh call the Tshilkotin *Pis-he′-hun-um;* the Thompsons, according to Mr. Mackay, *N-ku-tam-euh.* Mr. Mackay states that *N-ku* is the numeral "one," *tam-euh* or *tam-uh* means "land," the compound word thus signifying "one land," "one other land," or the people of another land or country. The Okanagans apply the same name to the Thompson Indians. The Shoo-whā′-pa-mooh name for the Okanagans is *Soo-wān′-a-mooh* (*Su-a-na-muh*, Mackay). English and Canadian people are named *sa-ma.* The people of the United States *Sui-apm-uh.*

2. *Stā′-tlum-ooh* (*Stlā′tlumQ*, Boas; *Stlat-limuh*, Mackay.) These are the people usually known as Lillooets. They inhabit a comparatively restricted territory which lies for the most part to the west of the Fraser River, and, generally speaking, extends westward into the rugged country of the Coast Ranges as far as the Indians carry their wanderings from the side of the Fraser. The dialect spoken by these people differs very markedly from those of the neighbouring Shuswap tribes. Their boundary on the side of the other Shuswap tribes has already been indicated, except to the south, where they meet the Thompson Indians. In this direction they extend along both sides of the Fraser nearly to Foster Bar of the maps, their lowest village here being that named *Nes-ī-kip*, on the west side of the river. To the west they claim Seton Lake, but, according to my informant, not Anderson or Lillooet Lakes of the maps.

3. *N-tla-kā-pe-mooh* (*Ntlakyā'pamuQ*, Boas ; *N-hla-kapm-uh*, Mackay). These people are generally referred to as the Thompson River Indians, or briefly as the "Thompsons." They are bounded to the north by the Lillooets and Shoo-whā'-pa-mooh, as already indicated, while to the east their boundary marches with that of the Okanagans, where they claim the country to the west and south of Nicola Lake, but not the borders of the lake itself. They occupy the entire Similkameen valley nearly to the place named Keremeeos, but exclusive of that locality, which belongs to the Okanagans. Westward they follow the tributaries of the Similkameen to, or approximately to, the watershed between these and the branches of the Coquihalla. They extend southward on the Fraser to Spuzzam, and westward in the Coast Ranges as far as the sources of streams flowing to the Fraser.

The N-tla-kā-pe-mooh, according to Mr. Mackay, call the Okanagans *Schit-hu-a-ut* and *Schit-hu-a-ut-uh*. The Indians of the Lower Fraser, who speak various dialects of the Kawitshin language of the "Comparative Vocabularies," again according to the same authority, name the N-tla-kā-pe-mooh *Somena*, or "inland hunters."

4. *Oo-ka-na-kane* (*Okanā'k'ēn*, Boas ; *U-ka-nakane*, Mackay). These people are generally known as Okanagans. They inhabit the country to the south and east of the Shoo-whā'-pe-mooh and N-tla-kā-pe-mooh, including Okanagan Lake of the maps and its vicinity. Their principal place or centre was in early days to the south of the international boundary, and this place, according to Mr. Mackay, is still known to them by the same name as that by which they designate themselves. Their eastern boundary is somewhat indefinite, as between Okanagan Lake and the Columbia valley there exists a large tract of broken wooded country, which was employed only as a hunting-ground. The Kettle River valley probably belonged to the Okanagans, but they seldom extended their excursions to the Columbia north of the international boundary. The Oo-ka-na-kane name for whites generally is *Pek-it-sa*, from *pek*, "white."

5. The *S-na-a-chikst*, a sept or tribe of the Salish proper, claim the fishing and hunting grounds along the western leg of the Columbia River, including the Arrow Lakes and the lower part of the Kootanie River from its mouth to the first fall, which was a noted fishing place. They now, however, migrate to the north of the international boundary only in the summer season, their centre and winter quarters being in Montana. Their country thus forms a wedge between that of the Oo-ka-na-kane and Kootenuha. The S-na-a-chikst being linguistically a subdivision of the Salish proper, of which the name has been extended to cover a group of linguistically allied people, do not stand quite in the same rank as the four larger divisions previously enumerated, and might appropriately be designated simply the Salish. The country occupied by them is included in that of the Oo-ka-na-kane on Dr. Boas' map. I have never met with these people, and the facts above noted, together with the rendering of the name, are derived from Mr. Mackay. The same gentleman states that the Pend d'Oreilles (Kullspselm, or "people of the flat land") and the Spokanes may equally be classed as branches of the Salish proper. The Salish proper, as is well known, were originally designated the "Flat-heads," though not in the habit of artificially deforming the cranium. When first discovered by the Canadian voyageurs, slaves from tribes of the coast, where the head was usually deformed, were found among them.

In concluding this general review of the tribal sub-divisions of the people here collectively named Shuswaps, it may be of interest to add the following list of names used

by several of these tribes and by other allied tribes for themselves as "the people" or "mankind." (See p. 4.) This has been drawn up by Mr. J. W. Mackay, whose orthography is retained:—

Tribe.	*"The People."*	*Tribe.*	*"The People."*
Se-huapm-uh.	Ka-la-muh.	Lower Fraser.	Hue-la-muh.
U-ka-nakane.	Ske-luh.	Songhees.	Hue-lang-uh.
N-hla-kapm-uh.	Ske-yuh.	Clallum.	Hue-yang-uh.
Tribes of Yale and Hope.	Hum-a-luh.	Kaue-chin.	Hue-la-muh.
		Skagit.	Hum-a-luh.

This alone serves very clearly to show the fundamental identity in language throughout, and the Salish connections of some of the peoples of the coast.

Villages and Houses.

The construction of the winter dwellings of the Shuswaps, or *Keekwilee*-houses as they are generally named in Chinook jargon, has been described in some detail by Dr. Boas in his paper already cited, and need not therefore here be entered into. As, however, these primitive and partly subterranean dwellings are now seldom seen, the plan and elevation of the main framework of a particularly characteristic one met with in the Nicola valley, differing somewhat from that illustrated by Dr. Boas, is here presented. The sketches upon which these are based were made by myself and Mr. J. McEvoy in 1889. Upon the main framework fascines of small sticks and brush are laid radially, and upon these the outer covering of earth is then spread. From the size of the hollows marking the former

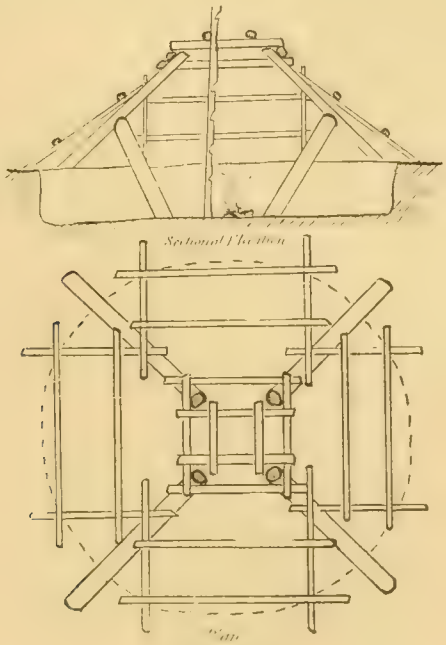

Fig. 1.

positions of houses of this kind in certain parts of the country, their diameters in some instances have been as much as twenty-five feet. The name of the winter house in Shoo-whā′-pa-mooh is *kaīs-is′-ti-kin*, in N-tla-kā-pe-mooh *sī-is′-ti-kin*.

The winter villages represented the permanent centres of the tribal subdivisions, to which the people gathered during the cold months of each year. The sites of these villages are still easily recognized, where they have not been converted into ploughed fields or removed altogether in consequence of gold mining operations. The localities have evidently in all cases been very carefully chosen, the essentials being a warm southern exposure as much sheltered as possible from wind, particularly the cold down-river wind of winter; a dry, sandy or gravelly soil, and convenient access to water. These winter village sites are, moreover, found only in the lower and larger valleys, and particularly in those of the Fraser and Thompson rivers and their main tributaries. Traces of single houses of this kind, or scattered groups of two or three, are occasionally, though rarely, found in some of the higher and smaller valleys, but nothing that might be named a village. The great paucity of the remains of residences of this kind in the Okanagan country would seem to indicate that the corresponding division of the Shuswaps scarcely used the Keekwilee-house, but further information on this point is desirable.

All the old village sites which were identified on the area of the Kamloops sheet of the geological map (shortly to be issued) have been clearly marked on it. Outside the area of this map, the following places were noted as important old village sites:—North Thompson valley near mouth of Barrière River; north side of outlet Little Shuswap Lake; flats near the mouth of Adams River between Great and Little Shuswap Lakes; south-west side of outlet of Adams Lake; low promontory where the present village stands near the lower end of Adams Lake.

The actual villages of the Shuswaps, as might be anticipated, frequently coincide in position with some of the old sites, but ordinary log-houses are now built.

Temporary summer residences at hunting or fishing places, are as a rule roughly constructed of poles, which are then covered with matting or roughly wattled with branches. The size and forms of these are very varied and quite irregular. A semi-permanent dwelling or lodge of more definite plan is, however, still also occasionally met with. This is also illustrated and described by Dr. Boas, but as a sketch made by Mr. McEvoy differs slightly from his and is also more detailed, it is presented here. Where I have seen these lodges they stand on the open ground without any excavation, and as they have been found in occupation both in spring and autumn, they can scarcely be classed as distinctively winter lodges, though doubtless used also at this season. In the figure, the brush work surrounding the nearer end of the lodge is omitted, but it will be understood that

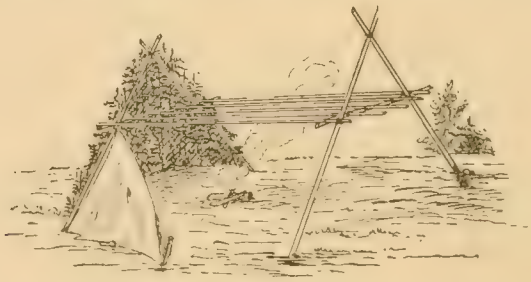

Fig. 2.

the two semicircular ends of the lodge, sheltered by brush, constitute the sleeping places, while the scaffold above serves for drying provisions or for storing these and other things out of reach of the dogs.

The sweat-houses or sweating booths of the Shuswaps are identical with those of the Tinneh, Crees and other peoples. They consist usually of about a dozen thin willow wands, planted in the ground at both ends. Half of them run at right angles to the other half, and they are tied together at each intersection. Over these a blanket or skin is usually spread, but I have also seen them covered with earth. A small heap of hot stones is piled in the centre, and upon these, after carefully closing the apertures, the occupant pours some water. The sweat-house is always situated on the banks of a stream or lake, so that on issuing therefrom the bather may at once plunge into the cold water.

The permanent marks of old inhabited places met with throughout the Shuswap country are of the following kinds :—

Sites of old Keekwilee-houses, in the form of hollows ten to thirty feet in diameter. These hollows soon become widely saucer-shaped depressions, and they mark the positions of old winter houses or winter villages. Old fish-câches.—These are found after the lapse of some time as similar hollows, but deeper and narrower in proportion, being usually from three to six feet wide only. As originally made they are cylindrical pits excavated in dry ground and lined with bark. Dried salmon is then piled into them, and the whole is covered with bark and earth. Such câches often occur about the sites of winter villages, but are also frequently found at a distance from these and grouped around the actual fishing places. Root-baking places.—In baking various roots, more particularly those of the lily (*Lilium Columbianum*), a spot is first cleared and a fire built upon it. When the surrounding soil has become sufficiently heated, the roots, enveloped in mats or green herbage, are laid upon the bed of the fire, and the whole is covered up by piling together the earth from all sides upon the mass of roots. After the lapse of a sufficient time the roots are dug out in a baked or steamed condition, and either at once eaten or dried for future use. Such root-baking places are usually in the vicinity of root-gathering grounds, and after some years appear as low cones from fifteen to twenty feet in diameter, with miniature craters in the middle. These might easily be mistaken by an imaginative antiquarian for old sacrificial sites, on account of the evident traces of fire which the stones and earth show.

To the above it may be added that a little group of fire-scarred stones buried in moss or other vegetation, and marking the site of an old sweat-house, is often found as an enduring sign of the spot near which a hunting or fishing camp has been pitched many years before.

One of the largest and most important sites of the old winter villages which has been noted is that known as *Hut-tsat-tsl*, or "cold spring." This is situated on the north side of the valley of Kelly Creek, about two miles below the lake. Just below the old village site the stream plunges precipitately down to the Fraser River, its lower valley being nearly impassable. If all the old Keekwilee-houses here indicated by hollows still visible were at any time simultaneously inhabited, the population must have been numerous. It has been long abandoned, and in and about the sites of the houses large trees of at least one hundred years of age are growing. The present Indians say that the old people carried their dried salmon up from the edge of the river to this winter village by way of the valley of the small stream immediately north of Kelly Creek, which is still named *Ni-hlip-tow'-us-tum*, or "going over stream," and on this route are two smaller groups of hollows representing houses and showing similar signs of considerable antiquity. The site of Hut-tsat-tsl was

an ideal one for a winter residence, being well sheltered, having a southern exposure, and being amply supplied with wood and water. The neighbourhood must also have been a good one for hunting deer.

Graves and Burial Places.

Near all the permanent villages or winter village sites are burial places, and for purposes of burial sand-hills were generally chosen, probably because of the ease with which graves might be dug in these. The burial places are often on prominent points of terraces or on low hills overlooking the river, along the main valleys, such as those of the Fraser and Thompson. Whether such prominent points were chosen on account of their position, or in how far they were merely selected because of the convenient occurrence of sand-hills, I do not know, but believe that both these circumstances may have co-operated. No burial places were noticed, however, on the higher plateaux or in the mountains, near the places to which the Indians resort for hunting, berry-picking or root-gathering, and it is probable that the bodies of those who died in such places were always in old times, as they still are, carried down to the lower and larger valleys for interment.

A small house-like or tent-like erection was generally made over a grave, and this was furthermore usually surrounded by a fence or enclosure, while poles with flags or streamers were also often set up at the grave. Some years ago, carved or painted figures, generally representing men, were commonly to be found about the graves along the Fraser and Thompson. The posts of the enclosure were also not infrequently rudely carved and painted, while kettles and other articles of property were hung about the grave or in its vicinity. Horses were in some cases killed, and the skins hung near the graves; but most of these objects have now disappeared, and crosses are very frequently substituted for the old carvings.

The most interesting old burial place met with, is that on the point of land between the Fraser and Thompson near Lytton. On this point is a low sand-hill which rests upon a rocky substratum, and stands probably 100 feet above the rivers. It is about 150 yards long and 50 or 60 yards in width, and has been employed throughout its extent for purposes of burial. Near the sand-hill there are traces of an old village site, but whether this was occupied contemporaneously with the burials it is impossible to say. The strong up-river winds have resulted in curtailing the limit of the sand-hill on its southern side and extending it northward, and this process has probably been considerably accelerated during the past twenty or thirty years by the destruction of the natural vegetation by cattle and horses. As a result of this, trough-like hollows are being worn out and hillocks of blown sand formed in new places, and much of the old burying ground has thus now been completely gutted. The sand-hill has evidently been used for purposes of burial for a considerable period, the interments having the greatest appearance of age being those at the southern end, while those at the opposite extremity have a comparatively modern aspect.

In 1877, when I first visited this place, large numbers of bones and of implements, etc., were lying about, and the collections then made, including seven moderately perfect skulls, are now in the museum of the Geological Survey. It was estimated that at least several hundred persons must have been buried here. It seemed, from what could then

be seen, that many or most of the bodies had been buried in the usual upright sitting posture, though others appeared certainly to have been bent into a sitting posture and then laid on the side, and a few cases seemed to shew that the bones had been laid closely together after the disappearance of the softer parts of the body. The implements and objects found had evidently been placed immediately about the body in each case, and in some instances numbers of flakes, scrapers, etc., were lying together in such a manner as to show that they had been contained in a single package. Yellow and red ochre was common in some of the graves, and in one instance the head had been thickly covered with red ochre, which still adhered to the skull. The best and most shapely implements found were those associated with bodies buried near the crest of the hill, and, generally speaking, the older occupants were better provided in this respect than the most recent. It seemed obvious in all cases, however, that the objects accorded to the dead were rather intended to represent certain forms of property than to be of actual utility. Thus may be explained the large proportion of flakes of arrow-stone to the number of arrows, and the fact that many of the latter were crooked, or from their size and slender form more ornamental than useful; also the occurrence of prettily coloured pebbles, crystals of quartz and calcite and pieces of mica. Small rod-like pieces of black slate, not unlike though somewhat thicker than ordinary slate-pencils, were moderately common.

Copper, in the form of small beaten sheets or plates, evidently used for purposes of ornament, was the only metal certainly found in association with the interments, though a drop-shaped piece of lead may have been so associated. No iron implements were found. A small blue glass bead seemed to belong to one of the later graves. There was thus little or no evidence of traffic with the whites at the time of the burials, and admitting that the objects above mentioned had been obtained in this way, it was conjectured that the place had been abandoned as a burying ground shortly after the whites first reached the West Coast, and that the older graves considerably antedated this period. The Indians now resident at Lytton state that they have no knowledge of the people who were buried at this place. It is, of course, impossible to affirm definitely that the people buried here were the ancestors of those now living in the same region, as most at least of the burials belong to a time which is practically prehistoric. It is highly probable, however, that these interments are those of the N-tla-kā-pe-mooh of the last century.

Various small animals appear to have been buried with some of the bodies, and amongst these the bones of a beaver and the jaw of some animal like a martin were distinguishable. These, with the occurrence of teeth of bears, perforated for suspension, and the nature of the weapons, would appear to indicate that the people were rather hunters than fishermen, though the presence of numerous adzes seems to suggest canoe-making as an art practised. Shells of dentalium and perforated scollop shells (*Pecten caurinus*) show that trade was carried on with the coast.

Of objects found in these graves besides those above referred to, the following may be mentioned:—Adzes made of wapiti antler, precisely similar to those found in shell heaps on Vancouver Island; jade adzes and chips and selvage pieces of jade cut from adzes during their manufacture; antler points and pointed bone awls or bodkins; stone skin-scrapers; borers of chert or arrow-stone, and notched edges of the same, probably for scraping and shaping thongs; pestle-shaped hammers and one oval hammer of granite, well shaped and with a deep median groove for attachment; straight pipes made of steat-

ite, shaped much like an ordinary cigar-holder and marked with patterns in incised lines. Mr. J. W. Mackay has since also obtained from the same place a small pipe which differs in shape from any heretofore seen by me in British Columbia. Of this, though not as that of a characteristic form of pipe, a figure is given. (Fig. 3.)

Fig. 3.

Another burial place which may be noted, is situated on the terraces above the bridge which crosses the Fraser near Lillooet. This, like the last, is being bared by the blowing away of the sandy soil. No very modern interments appear to have been made here, but some with which rusted fragments of iron, apparently knives, are associated, are probably not more than fifty years old. Numerous roughly made stone arrow-heads, together with many flakes and chips, again occur here, in association with the bones. Part of a straight steatite pipe, like those from the Lytton graves, was also found. With other bodies considerable quantities of dentalium shells had been buried, probably in the form of some ornaments the stringing thongs of which had disappeared. One skeleton was accompanied by several hundred neatly made flat bone beads, somewhat irregular in size and shape, and showing evidence of having been ground into form, apparently on some rough stone. Bone awls or borers of various sizes were abundant. Two pieces of fine-grained argentiferous galena were also found. These, if placed together by their flat edges, form a pear-shaped thick disc, with rounded outer edges. Each part is bored for suspension or attachment. Some at least of the bodies had been surrounded with bark, or the graves may have been lined with bark before the bodies were placed in them. Charcoal and ashes were in such association with the remains as to show that the bodies had either been partially burnt or that fires had been built above them after shallow burial—probably the latter, as none of the bones or objects buried with the bodies were themselves observed to show signs of fire.

Customs, Arts, etc.

I am unable to give any detailed account of the burial customs of the Shuswap people, but the following notes bearing on these were made in September, 1877, when I was camped near the mouth of the Coldwater, in the Nicola valley. A considerable gathering of Indians from different parts of the country was then occurring at this place. Two separate camps were formed, and when all had collected a sort of ceremonial reburial of the dead was to occur. The preliminary ceremonies in progress appeared to consist of dances, the women, dressed in their best, dancing, while the men sang, and men dancing in imitation of animals, such as the rabbit and the coyote. Singing and drumming accompanied all the dances, and I was informed that there was eventually to be a "potlatch"

or distribution of property, but was unable to ascertain the precise nature or order of the proceedings. One man was seen to arrive with the bones of a brother wrapped in a cloth and tied behind his saddle. The remains had in this case been brought from Vermilion Forks, on the Similkameen, where the man died about a year before, and were thus being returned to his own country, where the feast was in progress.

The Tshilkotin Indians, the nearest Tinneh tribe to the northward of the Shuswaps, are said to have frequently, though not invariably, burnt the bodies of the dead on a pile of logs, and when death occurred far from the home of the individual the ashes were carefully collected and carried back for ultimate interment.

The dead were never under any circumstances burnt by the Shoo-whā′-pa-mooh, with whom bodies were buried in a sitting posture, wrapped in deer skins. The notes already given respecting the graves near Lillooet, go to show that if bodies were not burnt by the Stā′-tlum-ooh, the building of a fire on the grave was at least occasionally a portion of the mortuary rite.

The following notes respecting other customs of the Shuswaps are very incomplete, but already most of the usages referred to have either disappeared or have become much modified:—

Mr. J. W. Mackay informs me that he has discovered that, in primitive times, in the case of a man dying and leaving behind him a widow or widows, his brother next in seniority took the widow to wife. The right of a man to the widow of his deceased brother was considered as incontestable as that to his own wife or wives, and the women had equally a claim to receive from him the duty of a husband, which if not accorded rendered the man despicable in the eyes of his tribe, and absolved the widow or widows from their duty to him.

The proper name of a man is changed from time to time during his life, the new name assumed being that of some dead kinsman. No strict rule obtains now as to the name taken, whatever may have been the usage formerly. Thus a man may at will adopt the name of a dead elder brother, or that of his father if dead. No ceremonial feast occurs on this occasion, but merely a gathering of the people at the instance of the chief, when the new name is announced.

Young men on reaching manhood were accustomed to separate themselves and go away alone into some solitary part of the country, where they would sometimes remain for three or four months. They might hunt or trap, but must avoid contact with other people and keep away from habitations. Occasionally a young man thus engaged would clear a course in the woods or arrange bars for running or for jumping, and thus endeavour to increase his strength and endurance. They also meditated and dreamed dreams till each discovered his particular guardian spirit.

Young women, at the time of reaching maturity, and thereafter at recurrent periods, are accustomed to wander forth alone after dark, for considerable distances, breaking small branches from the trees as they go and scattering them about or suspending them upon the limbs of other trees. Young fir-trees a few feet in height are thus often split and torn apart for several feet, or the branches or growing tops tied in knots. This custom still prevails and the tokens of it may often be observed near Indian camps. No explanation of its meaning can be offered.

I find, as the result of special enquiry on the subject, that all the Shuswaps formerly had hereditary hunting grounds, each family having its own peculiar hunting place or places. This custom is still preserved among the Indians of the Nicola region, and formerly obtained among the Kamloops people also, though it is there now practically obsolete.

An Indian who invites another to go hunting with him, gives to his friend the first deer, if several are killed. If but one is killed it is divided, but the skin belongs to the friend in any case. If a man is hunting beyond the border of the recognized territory of his people, and one of the men holding claims to the region upon which he has thus trespassed hears him shoot, the owner of the locality heads for the place, and on arriving there expects to be feasted on the game obtained by the hunter.

Various more or less obvious devices are resorted to for the purpose of conveying information by signs. A rag of clothing, particularly a small piece or pieces of coloured or other easily recognizable material from a woman's dress, left in a forked twig, indicates that a person or party of persons has passed. If the stick stands upright, it means that the hour was noon, if inclined it may either point to the direction of the sun at the time or show the direction in which the person or party went. If it is desired to show both, a larger stick points to the position of the sun, a smaller to that of the route followed. If those for whose information the signs are left are likely to arrive after an interval of several days, a handful of fresh grass or a leafy branch may be left, from the condition of which an estimate of the time which has elapsed can be formed. Such signs are usually placed near the site of the camp-fire. Simple devices of this kind are, of course, by no means peculiar to the Shuswaps.

I am unable to confirm Dr. Boas' statements respecting the use of a sign language. (*Op. supra cit.* p. 87.) Signs are employed as an adjunct to speech, but, so far as I have observed, not more commonly or systematically than is usual with any other Indians.

The "potlatch" or donation feast, which is everywhere among the tribes of the littoral of British Columbia most important, does not seem to have occupied a prominent place among the customs of the Shuswaps. Traces of it are nevertheless found in connection with feasts for the dead, marriage feasts, etc.

Very considerable changes have occurred among the Shuswaps since the introduction of the horse among them. This, according to notes given on a later page, appears to have happened very early in the present century. The horse has now become the most valued property of the natives, and the possession of many and good horses the most important element of wealth and social prominence. Though the knowledge of horses is thus comparatively recent, it is often only after consideration and reflection that the present Indians will admit that at a former time they were without horses.

In addition to the ordinary and always rough dug-out canoe, made from the cottonwood, and employed occasionally on certain lakes or for the crossing of rivers, the Shuswaps in the eastern part of their territory in British Columbia, made small and shapely canoes from the bark of the western white pine (*Pinus monticola*). These may still occasionally be seen on Shuswap Lake and in the vicinity of the Columbia. The inner side of the bark, stripped from the tree in one piece, becomes the outer side of the canoe, which is fashioned with two sharp projecting spur-like ends, strengthened by wooden ribs and thwarts internally; the whole is lashed and sewn with roots, and knot-holes and fis-

sures are stopped with resin. The canoes thus made are very swift, and for their size, when properly ballasted, remarkably seaworthy. (Fig. 4.)

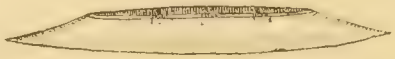

Fig. 4.

The salmon, in its various species, is one of the principal sources of food supply for all the tribes living along the Fraser and Thompson and their tributaries. Dried salmon forms a considerable part of the provision made for winter, and before attempts at agriculture were begun constituted the sole winter staple. The right to occupy certain salmon-fishing places, with the annual visit to these of the more remote families and the congregation of large numbers of Indians at specially favourable places, largely influenced the life and customs of the Shuswaps. In the same way, the most important news which could be conveyed from place to place, if not that of some warlike incursion, was that of the arrival of the salmon or the success or otherwise of the fishery.

Besides the salmon ascending from the sea, a small land-locked salmon (*Oncorhynchus nerka* var. *Kennerlyi*), common in the large lakes, is extensively taken in traps and weirs, when ascending streams to spawn, in September. The lake-trout and brook-trout are also made the objects of special fisheries in certain localities, and the white-fish is taken in some lakes in which it abounds. Many methods of catching the salmon and other kinds of fish are practised.

On the large and rapid rivers, including all that part of the Fraser which runs through the country of the Shuswaps, with much of the Thompson, the salmon is usually taken in a bag-net fixed to the end of a long pole. (Fig. 5.) This is manipulated by a

Fig. 5.

man who stands on a projecting stage above some favourable eddy or other suitable and always well known spot, which is thus occupied every year at the appropriate season. This is the same mode of fishing which is practised by the Indians who occupy the banks of the Fraser below the Shuswap territory. In tranquil reaches of the South Thompson

and in some other places, such as the entrances to various lakes, salmon and other fish are speared by torchlight, the usual three-pointed and barbed fish-spear being employed.

On the smaller rivers and streams, weirs and traps of various kinds are in use. One of the common forms, named *tsil-min'* by the Shoo-whā'-pa-mooh, is illustrated in the accompanying sketch, (Fig. 6) which is from a photograph taken on the Nicola River in 1889. It is, of course, essential that a weir of this kind should run completely across the river. In attempting to leap over the obstruction the salmon fall into the basket-like arrangement on the upper side. The framework of the structure is lashed together with bark, and the weir itself is formed of willow or other suitable sticks.

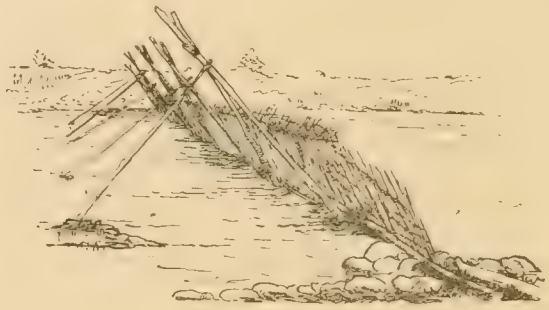

Fig. 6.

Another form of trap, noted on the Barrière River, consists of two weirs or fences, each of which stretched completely across the stream. Both fences in this case sloped back up stream. The lower one was formed of upright parallel sticks, duly supported, and was provided with inlets below, consisting of converging sticks, which enabled the salmon going up stream to push through, but prevented their return. The upper fence or weir consisted of horizontal poles and withes closely wattled in and supported by stakes. Between the two weirs the salmon remained till from time to time removed by the owner with a fish-spear of the usual type. (Fig. 7.)

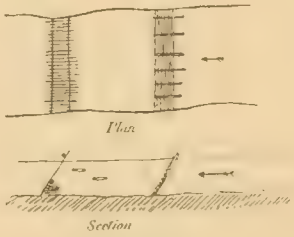

Fig. 7.

For catching trout in smaller streams, the Shuswaps also employ a cylindrical fish-trap composed of split pine sticks (*P. Murrayana*) lashed together, and having an entrance at one end formed of convergent pointed sticks. One or more of these are fixed in a suitably constructed weir. This trap is identical with that employed by the Tinneh to the north. It is named *Pip'-uh* by the Shoo-whā'-pa-mooh, and is generally employed in catching trout which are running up to spawn.

Another simple but effective trap, used for fish when descending the small streams, or running out of the smaller lakes, is shewn by the annexed diagram. (Fig. 8) The two trough-shaped parts of which this consists are formed of willow sticks tied to bent cross-pieces of the same or other suitable wood. The convergent down-stream end of the lower trough, is simply arranged by tying together the leafy extremities of the branches of which it is composed. The upper entrance to the trap is partly concealed by overhanging leafy boughs. The owner sits at no great distance, so that the fish may be removed whenever they enter the lower trough and before they have time to escape by leaping or otherwise. The Shoo-whā'-pa-mooh name of this trap is *mooh'*. (Fig. 8.)

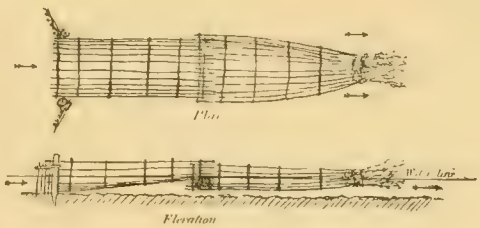

Fig. 8.

The Thompson Indians say that fire was originally obtained by them by friction, a wooden drill being turned between the palms of the hands for this purpose. The point of the drill was pressed against a second piece of wood, the dry root of the poplar being used for this purpose. When it was desired to carry fire for some distance, dry cedar bark was made up into rolls (described as being four or five feet long), which gradually smouldered away, lasting for a long time. Where cedar-trees did not grow near the villages the bark was sought for in the neighbouring mountains.

Bows were formerly made chiefly of the wood of the juniper (*Juniperus occidentalis*), named *poontlp*. They were also sometimes made of yew (*Taxus brevifolia*), named *skin'-ik*, though this tree is scarcely to be found in the Shuswap country. It is reported, however, to grow far up the North Thompson valley. The bow was often covered on its outer surface with the skin of a rattle-snake, which was glued on in the same manner which was customary among some tribes of the Great Plains. Arrows were made of the wood of the service-berry. Arrow-heads and spear-heads were made of various kinds of stone, always chipped. The materials are mentioned later in connection with the tradition of the origin of the arrow-stone proper.

There are within the country of the Shuswaps three notable and well-known localities from which red ochre for paint was derived. One of these, named *Skwō'-kil-ow*, is situated on the east side of Adams Lake, five miles from the lower end of the lake. Another, named *Tsul'-a-men*, or "red paint," is the remarkable red bluff from which the Vermilion Forks of the Similkameen River is named, the name of the north branch, Tulameen, representing the Indian word just quoted. This bluff is about three miles above the Forks.[1] The third locality is on the Bonaparte, not far above the mouth of Hat Creek. This has not been precisely identified nor was its name ascertained.

[1] For description see 'Report of Progress Geol. Surv. Can. 1877-78,' p. 130 B.

The paint-producing locality on Adams Lake is still widely known among the Indians, and is said to have been resorted to from time immemorial. There is here near the beach a shallow cave, which has evidently been somewhat enlarged if not altogether formed by digging for ochre. It is hollowed along the strike of some soft pyritous schists, kept damp by springs, and in which the decomposition of the pyrites produces an abundance of yellow ochre. This is collected and burnt, when it assumes a bright red colour. A black shining mineral was also used in old times to paint the face. This was either micaceous iron or graphite, probably the former. My informant did not know whence it was obtained, but several places from which either mineral could be got are now known.

In former times the bark of *Pinus ponderosa* was much in repute as fuel when the Indians were upon warlike expeditions. A fire made of this bark goes out quickly and does not afterwards smoulder, and it is difficult to tell by an inspection of the embers how long ago the fire was made.

Baskets are made of the tough roots of the spruce cut into strips, with which the split stems of grass are worked in by way of ornament. The latter are often dyed with black or red colours. The commonest form is that shown in figure 9. It is usually carried upon the back, by women, and is employed for many purposes.

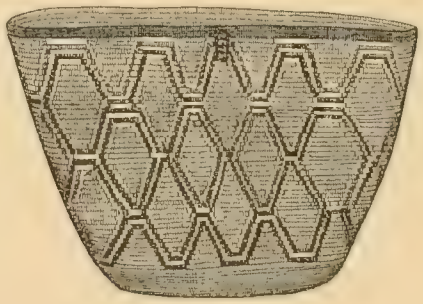

Fig. 9.

In a paper on the occurrence of jade or nephrite in British Columbia and its employment by the natives,[1] I have referred to the fact that implements, chiefly adzes, of this material are not only abundant on the littoral of the province, but are also found in connection with Indian graves, etc., along the lower portions of the Fraser and Thompson Rivers within the territory of the inland Salish people. It was also noted that small partly worked boulders of jade had been found on the Fraser and Thompson At a later date I was enabled to announce the discovery of rolled pieces of jade in the gravels of the Lewes, a tributary of the Yukon River,[2] and in 1888 similar unworked fragments and rounded boulders of jade were found by Dr. B. J. Harrington and myself, about the site of the old Indian village at Lytton which is alluded to on a former page. A description of these, with analyses, has been given by Dr. Harrington.[3] It may now be considered as certain, that the jade employed by the natives in the southern part of the interior of British

[1] 'Canadian Record of Science,' 1887.

[2] 'Annual Report Geol. Surv. Can. 1887-88,' p. 38 B.

[3] 'Trans. Royal Soc. Can.,' vol. viii, Sect. III, p. 61.

Columbia, was obtained by them in the form of rounded masses from the gravel banks and bars of the Fraser and Thompson. Thence it was doubtless carried in trade as far at least as the territory of the Shuswap people extended, though always most abundant in the vicinity of the rivers of its origin. Good specimens of jade adzes have been found at Little Shuswap Lake and at Kamloops.

In the paper above referred to, it was stated that the jade had been cut into flat pieces and these subsequently trimmed by sawing with a thong or thin piece of wood in conjunction with sharp sand. Subsequent and more extended enquiry, however, shows that the Indians employed for this purpose crystals of quartz, or fragments of such crystals. This depends on the statements of living Indians, but is borne out by the occurrence of such crystals with worn edges in association with cut fragments of jade at Lytton.

The pestle-shaped hammer so common along the coast, is found also all along the Fraser and Thompson rivers within the country of the Shuswaps. A specimen of the same form has been presented to the museum of the Geological Survey by Mr. D. A. Stewart, C.E., which was obtained on that part of the Kootanie River between the lake of the same name and the Columbia. This carries the pestle-shaped hammer to the extreme eastern limit of the Shuswap people.

I am not aware that any specimens of the large stone mortars of the coast, have ever been in the possession of the Shuswaps or have been found in their country.

The measures of length employed by the Shuswap Indians are as follows:—

Kō-poop, the fathom. Extremities of the arms extended.

Kit-sī-talis, the half fathom. Extremity of the arm to the breast.

Ma'-sukst, four fingers, *i.e.*, the width across the knuckles when the hand grasps a stick or other similar object.

En-kō-teh-skwaht, the foot-length. Measured on the ground by placing the heel of one foot to the toe of the other.

Skw-tows', the half foot. Measured with closed hand, thumb extended, from the knuckle of the fourth finger to the extremity of the thumb.

———, the span. Measured with the hand pressed out, front downward, from the end of the long finger to that of the thumb. The hand is so placed that the thumb and long finger are nearly in line.

Plants used as Food or for Other Purposes.

Several native roots still constitute notable items in the food of the Shuswaps, though their importance in this respect has much decreased since flour and other farinaceous foods have become common, and particularly since the cultivation of the potato has become customary among the Indians. Roots are always dug and cooked or cured by the women. In digging the roots a pointed stick about four feet in length, with a crutch-shaped handle, is used.

The native root chiefly sought for and most largely employed is that of the lily (*L. Columbianum*), named *tāh-tshin'* in both Shoo-whā'-pa-mooh and N-tla-kā-pe-mooh. This often weighs several ounces, and the places in which it abounds are well known and

regularly visited in the early summer or autumn. These localities are generally situated at some height above the principal valleys, on the plateaux or mountains, where camps are formed during the season of harvest. One of the most noted localities for this and other roots is that named Botanie, and this is the special resort of the N-tla-kā-pe-mooh Indians. This root, like most of the others, is cooked by baking in the ground.

The root of the Balsamorhiza (*B. sagittata*) is also eaten, being previously roasted or baked in the ground for a period of two or three days. Signs of the old roasting-places are common on hillsides where the plant abounds. The root itself is rather woody, but even when fresh has a not unpleasant liquorice-like taste. It is named *tsūt-tsilk'* by the Shoo-whā-pa-mooh, *sin-īl-kun* by the N-tla-ka-pe-mooh.

The cinquefoil (*Potentilla anserina*) affords an edible root, of which large quantities are gathered in some places, in the autumn. *Put-hīl-i-hīl*, the name of Three-Lake valley, is also that of this plant.

Early in July the wild onion (*Allium cernuum*), nearly ready to flower, is in condition to be gathered, and some families, camping in favourable places for the purpose, engage in this harvest. The women search the open woods and hillsides with crutch-like root-digging sticks in hand, and as each bunch of roots is extracted deftly toss it over the shoulder into a basket carried on the back. Returning to camp, the collections of the day are roasted or steamed in the usual way. They are next dried, and finally made up very neatly into bundles or chaplets and stored for future use. Thus treated the roots are nearly black, and are said to be sweet-tasted.

The root of *Peucedanum eurycarpum* and probably those of other species of the same genus are articles of food, while Mr. J. M. Macoun informs me that in June he found the Indians digging the roots of *Hydrophyllum capitatum* at Botanie for the same purpose.

Another root eaten by the Shuswaps is that of the little Claytonia or spring beauty (*C. sessilifolia*), which grows high on the mountains, and sprouts there along the retreating edge of the snow. The root of the dog-tooth violet (*Erythronium giganteum*), which grows with the last mentioned, is also eaten.

In some places on that part of the Columbia which is included in the territory of the Shuswaps, the camass (*Camassia esculenta*) is abundant, and forms an important article of diet.

The following excellent description of the mode of cooking the camass in this district is given by Mr. J. M. Macoun. It will serve equally to explain the process of cooking roots of other kinds :—

"The bulbs were collected by the Indians before the seed was fully matured, at which time they consider them at their best. The party I speak of had between twenty and twenty-five bushels of them at the lowest estimate. For two or three days before cooking was begun, the women of the party were engaged in cutting and carrying to camp branches of the alder and maple (*Alnus rubra* and *Acer glabrum*). Several bundles of the broad leaves of *Lysichitun Kamtschatcense* (skunk-cabbage), and two or three of *Alectoria jubata*), the black hair-like lichen that grows in profusion on *Larix occidentalis*, had been brought with them.

"Everything being ready, the men of the party cut down a huge pine for no other object, apparently, than to obtain its smaller branches, as no other portion of it was used.

A hole about ten feet square and two deep was then dug in a gravelly bank near the lake shore, which was filled with broken pine branches. Upon these were piled several cords of dry cedar and pine, and this was covered over with small boulders. The pile was then lighted in several places, and left for some hours to take care of itself. When the Indians returned to it the stones lay glowing among a mass of embers. The few unburnt pieces of wood which remained near the edges were raked away, and the women with wooden spades banked up the sides of the pile with sand, throwing enough of it over the stones to fill up every little crevice through which a tongue of flame might be thrust up from the coals that still burned beneath the stones. Then the whole was covered with the maple and alder boughs to the depth of a foot or more after they had been well trampled down. Over these were placed the wide leaves of the skunk-cabbage until every cranny was closed. Sheets of tamarac-bark were then spread over the steaming green mass, and upon these the bulbs were placed. About half of them were in bark baskets closed at the mouth, and each holding about a bushel and a half. These were carried to the centre of the pile. The lichen of which I have spoken was then laid over the unoccupied bark, having been well washed first, and over it were strewn the bulbs that remained. The whole was then covered with boughs and leaves as before and roofed with sheets of bark. Upon this three or four inches of sand was thrown, and over all was heaped the material for another fire, larger even than the first one. When this was lighted the sun was just setting, and it continued to burn all night.

"The next morning our camp was moved away, and I was unable to see the results of the day's labour. I was told, however, by one of the Indians who could speak a little English, that their oven would be allowed a day in which to cool, and that when opened the bulbs in the baskets would have 'dissolved to flour,' from which bread could be made, while those mixed with the lichen would have united with it to form a solid substance resembling black plug tobacco in colour and consistency, which could be broken up and kept sweet for a long time."[1]

The picking of each kind of berry is regulated by custom. For each recognized berrying ground some experienced old woman takes charge and watches the ripening of the fruit. Finally, when it is full time, word is sent to the other neighbouring Indians and the harvest begins. The picking and drying of berries is, of course, women's work. The service-berry (*Amelanchier alnifolia*) is the most important. It is often dried after having been partly cooked, and in the form of black cakes is thus kept for winter use. The mode of drying these berries is similar to that in use by the Tinneh tribes to the north. A large species of blueberry (*Vaccinium myrtilloides*), named *wī-naH* in Shoo-whā-pa-mooh, *tsoo-tsī-lup* in N-tla-kā-pe-mooh, is also important. This generally grows pretty high on the mountains, and to the well-known spots where it abounds excursions are annually made at the appropriate season. The very small low-growing blueberry (*V. myrtillus*), which abounds in some wooded places in the autumn, is also gathered in large quantities. For collecting these berries a wooden scoop with a comb-like edge is employed, the excessive labour otherwise necessary being thus obviated.

The wild currant (*Ribes cereum*), which grows well only on the dry slopes of the lower and hotter valleys, is also esteemed, and the berry of *Shepherdia Canadensis*, which is

[1] 'Garden and Forest,' July 16, 1890.

common only in high cool woods, is largely used, notwithstanding its bitter taste. No edible berry is, in fact, altogether ignored, and few edible substances of any kind, though, curiously enough, none of the Indians ever heard of anyone eating the mushroom, which is often abundant.

Of the black or bull pine (*P. Murrayana*), the cambium layer is eaten when it is soft and gelatinous, at the time the leaves are still growing. The thin bark is peeled off and the cambium layer scraped from the surface of the wood. It is sometimes dried and kept, the whole process being precisely the same with that practised by the Tinneh. In the Shoo-whā'-pa-mooh dialect this tree is named *ko-kwil-īit'*, the cambium layer *stē-o-kwulk'*. The cambium of *Abies subalpina*, *ml-ēnlp'*, and that of the cottonwood (*Populus trichocarpa*) is also sometimes eaten.

The sappy and still nearly white parts of the large leaf-stalks and stems of the *Heracleum lanatum* are eaten in the spring, before the plant acquires the acrid taste which it has at maturity. This, again, is a favourite article of diet with the Tinneh, and when taken at the right stage is not much inferior to celery. This plant is named HOH-*tulp* by the Shoo-whā'-pa-mooh, *hā-ko* by the N-tla-kā-pe-mooh.

When the cones of *Pinus albicaulis* are fully formed, toward the end of summer, but before the scales expand and allow the nutlets to fall, the Indian women resort to the mountains where these trees abound at heights between 5,000 and 6,000 feet, often camping for days there, and gathering and eating the nutlets. The trees are generally not large, and those which have a load of cones are usually cut down in order to obtain the cones. The cones may be simply roasted in the fire, when the scales are easily broken off like those of an artichoke, and the nutlets may be eaten from the central core in the same manner in which green corn is eaten. They have a not unpleasant taste, though with a distinct suspicion of turpentine, and are nearly the size of small garden peas. When the cones have been roasted the nutlets are also sometimes beaten out and dried, and thereafter bruised together with berries and eaten. The tree is named *is-tshī-'kālp'*, the cones *is-tshī-ka-kīn'*, and the nutlets *is-tshī'-'kuh*, in the Shoo-whā-pa-mooh language.

Nutlets from the cones of the yellow pine (*Pinus ponderosa*) and the Douglas fir (*Pseudotsuga Douglasii*)—*Skā-ā'p* in both Shoo-whā'-pa-mooh and N-tla-kā-pe-mooh—though much smaller, are also eaten. In this instance the women take advantage of the squirrels and mice as collectors and rob the stores laid away in hollow logs or stumps by these animals.

The pith or inner part of the stalk of the Epilobium (*E. spicatum*) is eaten while still young and sappy. This is also commonly employed as an auxiliary article of diet by the Tinneh tribes in Northern British Columbia. It is easily obtained free from the woody part of the stalk by running the back of the thumb-nail along the broken stalk. The Shoo-whā'-pa-mooh name of this plant is *tsē-ha-nulp'*, the N-tla-kā-pe-mooh *ts*H*ā-kāt*.

The black hair-like lichen (*Alectoria jubata*), which grows abundantly on the higher plateaux and mountains upon trees in thick woods, is eaten by the Shuswap people as by the Tinneh to the north. It is called *wī-luh* by the Shoo-whā'-pa-mooh, and *wī-uh* by the N-tla-kā-pe-mooh. Having been collected by the women, it is first freed from twigs and bark and washed in water. Then, surrounded by leaves, etc., it is placed in a hole in the ground and a fire is made above it. The roasting continues for a night, after which it

comes out as a flat black mass, which is eaten and said to taste very sweet. The lichen may be gathered at any season.

The yellow lichen (*Evernia vulpina*), generally found in abundance on the trees at elevations exceeding 3,000 feet above the sea in the southern interior of British Columbia, was formerly used as a dye-stuff for hair, cloth, etc. It was boiled in water to extract the colouring matter, and is named *ta-kwul-a-muk'-oo* by the Shoo-whā'-pa-mooh.

A black dye is said to be obtained from the root of a fern which grows in damp places (either *Asplenium felix-fœmina* or *Aspidium munitum*). Another black dye was produced by boiling together alder bark with roasted iron pyrites. A red dye is obtained from the bark or twigs of the alder boiled in a wooden vessel or basket, also from the stem of a plant which produces a yellow flower (species not recognized). Another red dye consists of the juice of the seeding-head of *Chenopodium capitatum*.

The leaves of the syringa (*Philadelphus Lewisii*), which abounds in some parts of the country of the Shuswaps, are said to have been formerly employed in lieu of soap in washing clothing.

The poisonous plant best known to the Shuswaps as such, is the white helebore (*Veratrum viride*), which grows abundantly only at a considerable height in the mountains.

A native substitute for tobacco was in early times, before the arrival of white traders, collected in some parts of the Shuswap country and much prized. It is almost certain that this was the *Nicotiana attenuata*, which is still found occasionally, and appears to be native. It is not supposed that this plant was at any time cultivated by these Indians. I was informed that the Sho-whā'-pa-mooh name of this native tobacco (also now applied to the imported tobacco) is *simin-min-hooh'-a-looh*. The N-tla-kā-pe-mooh name of the native tobacco was variously given to me as *skuk-wai'-āl-uh* and *skwa-yēl'-ow*.

The ordinary custom of mixing the leaves of the bear-berry (*Arctostaphylos Uva-ursi*) or bark of the red osier dog-wood (*Cornus stolonifera*) with tobacco in smoking, is also practised by the Shushwaps.

The principal fibre plant employed in the construction of nets, cord, thread, etc., was the large Asclepias (*A. speciosa*), named in N-tla-kā-pe-mooh *spēp'-sum*, from which the name of Spatsum Station on the railway is derived. The common nettle of the country (*Urtica Lyallii*) was also doubtless used for similar purposes as mentioned by Dr. Boas.

Historical Notes.

Respecting the origin of the Shuswap people or the quarter whence they arrived to take possession of what is now their territory, I am unable to offer anything of definite value. The circumstance that the chief work of their principal mythological hero, *Skil-āp'*, consisted in descending the Fraser to open a way for the salmon, may be supposed to embody the history of some early conflict with the people living along that river for the possession of its valuable fisheries. This may be accounted a legitimate conjecture, but is certainly at present nothing more.

It may further be noted, however, that the name given to the place where the Indian reservation on the Thompson now is (forty-two miles up that stream), is susceptible of a concordant explanation. This name is *Tsuk-tsuk-kwālik'*, said to mean the "place of red

trees," and refers to the red colour of the bark of *Pinus ponderosa*. As this locality is about the northern limit of the tree, which is abundant southward, it appears to be possible that the place was originally reached and named by people coming from the north, and therefore unfamiliar with the striking appearance of the pine in question.

As the study and comparison of what is known or may yet be learnt of the Shuswaps may result in some more definite views on the subject of their origin, these remarks are, however, merely thrown out as suggestions for enquiry and under all reserve.

Mr. J. W. Mackay, from different sources, has put together the following notes bearing on the early history of the Indians now inhabiting the Similkameen country. In quoting these notes, which Mr. Mackay has kindly communicated to me, I retain his orthography of the native names :—

A long time before the white man first came to the country, a company of warriors from the neighbourhood of the Chilcotin River made their appearance in the Bonaparte valley, apparently with the object of attacking the Indians who were there and of making slaves of such as they could take alive. This happened during the salmon-fishing season.

At that time it was customary for the Shuswaps who lived on the banks of the Thompson between Kamloops and the mouth of the Bonaparte and in the Bonaparte valley, to take their winter stock of salmon from the Fraser River at the western base of the Pavilion Mountain.

The warriors above mentioned had evidently calculated that most of the Shuswaps would be absent from their winter quarters on the Bonaparte and Thompson valleys, and would be encamped on the Fraser River during the salmon season, and that therefore they might make an easy prey of the few Indians who might be remaining in these valleys. It happened that during the previous winter provisions had been more than ordinarily scarce, in consequence of which all the Shuswaps belonging to these localities had removed to their salmon fisheries on the Fraser.

The strangers from Chilcotin were evidently ignorant of the geography of the country into which they had penetrated, and as they saw no Shuswaps where they had expected to find them, they continued their advance southward down the Bonaparte and Thompson valleys till they reached a position opposite the mouth of the Nicola River. At this place they were discovered by some scouts belonging to the N-tla-kā-pe-mooh tribe, who immediately descended to Nicoamen and Tl-kam-cheen (Lytton), where most of the members of this tribe were assembled for the salmon fishery. They gave the alarming information that a hostile company was advancing down the Thompson.

A strong force of the N-tla-kā-pe-mooh immediately set out to intercept the strangers, and having soon ascertained their position and probable strength, established themselves both in front and behind them. The intruders, after they discovered that they were thus menaced by a force stronger than their own, took advantage of the night to cross the Thompson and proceeded to ascend the Nicola valley. The N-tla-kā-pe-mooh followed and harassed them, continuing to do so till the strangers were driven into the Similkameen valley, where they took a firm stand, and by their prowess, obliged their pursuers to desist from molesting them. The strangers were mostly young men, who had their wives with them, but only a few children, for in these primitive days the women accompanied their husbands to war and were valuable auxiliaries. The neighbouring N-tla-kā-pe-mooh and Salish of the Okanagan soon discovered that the stranger women were larger and

better looking than their own, and treaties for peace and intermarriages were made. The language of the strangers fell gradually into disuse, and only a few words of it are now remembered by the oldest Indians of the Similkameen, the N-tla-kā-pe-mooh and Okanagan dialects being now used by these people indiscriminately. These strangers, who are said to have come from the Chilcotin country, are thus the earliest inhabitants of the Similkameen valley of whom any account has been obtained.

The traditions and legends of the British Columbia Indians would make it appear that before the advent of the whites the different tribes of Indians were constantly at war and endeavouring to enslave the weaker bands. The more northern races were the most warlike and were continually dispossessing the less warlike southern tribes of their fisheries and hunting grounds. It thus appears possible that the intruders may really have been a Tinneh tribe which was driven south before the advance of the Tinneh now inhabiting the Chilcotin region.

Mr. Mackay then gives the following list of words, collected a few at a time from different sources, as representing all that can now be got of those of the old primitive language of these immigrants. It will be observed that a considerable proportion of the whole are the same with those obtained by myself from Joyaska, on the Nicola, so much so that possibly some of these words were actually obtained by Mr. Mackay from this old man. The story above narrated evidently applies equally to the older Indians of both the Nicola and Similkameen. The matter being one of considerable interest, Mr. Mackay's complete list is here given in his own orthography :—

Si-si-aney, ram of the mountain sheep or bighorn.
T-pae or *Ti-pae*, ewe of the mountain sheep or bighorn.
Ti-li-tsa-in, give me the spoon, or bring me the spoon.
Tin-ih, bear-berry (*Arctostaphylos*).
Ska-kil-ih-kane, rush mat.
T-haeh, man.
Tsik-hi, woman.
Sass, bear.
Sa-pie, trout.
Ta-ta-ney, knife.
Sa-te-tsa-ē, spoon made of mountain sheep horn.
Tlohst-ho, snake.
N-shote, give it to me.

NUMERALS.

1. *Sa-pe.*
2. *Tun-ih.*
3. *Tlohl.*
4. *Na-hla-li-a.*
5. *E-na-hlē.*
6. *Hite-na-ke.*
7. *Ne-shote.*
8. *K-pae.*
9. *Sas.*

An Indian named Joyaska, who lives in the Nicola valley, below the lake, and who is probably over sixty years old, informed me (in 1888) that he, with seven other men and some women and children belonging to them, were now the only remaining true natives of the Nicola region. Most of the Indians now living in this region are, according to him, comparatively new comers from the Similkameen and Thompson River countries, who have settled in Nicola because of its good grazing lands and otherwise favourable situation. He further states that his people spoke a language different from that now

spoken in the country. His father spoke this language, but as he was but a little boy when his father died, he remembered only a few words. He could not say whence his people originally came, but after endeavouring to get him to think this out unsuccessfully, I asked him if the old language was like that of the Tshilkotin (Tinneh) to the north, and he said it was the same. After much thought, he gave me the following words as belonging to the old language, and even of some of these he did not appear to be quite sure:—

Sus, grizzly bear.
Tsē-a-kai', woman.
Nootl or *tét-hutz*, man (alternative words).
Klos-ho', rattlesnake.
Sis-yā-nē', big deer of old; either wapiti or caribou.
Tīt-ta-ā-nē', knife.
Ti-pī, mountain sheep.
Si-pai', lake trout.
Notl-ta-hat'-se, wild currant?
Sit-ē-tshī-ı', spoon.
Pin-a-lē-ēl-ī-ītz', look out! or take care.

Of these words, that for bear is identical with the Tshilkotin, and that for woman is nearly identical with the word obtained by me with the same meaning from the Nakoontloon sept of the same tribe.

The following interesting account of the first knowledge of the whites obtained by the Northern Salish, and more particularly by the Shuswaps, is also due to Mr. J. W. Mackay, who states that, in compiling it, he has endeavoured to bring together the different narratives of the event which he has heard. As in the previous case, I retain his orthography unchanged:—

Pila-ka-mu-lah-uh was a Spokane chief connected, through his mother, with the Okanagans of Penticton (lower end of Okanagan Lake) and the Shuswaps proper of Spallumsheen (between the head of Okanagan Lake and Great Shuswap Lake). One of his wives, the mother of N-kua-la, was a Similkameen woman of the Tinneh type, which is clearly shown in the physique of her descendants to the present day. In the father's time, the tribes living west of the Rocky Mountains and near enough to the Great Plains to engage in the hunting of the buffalo, were in the habit of crossing the mountains every summer for this purpose. They banded together for mutual protection against the Blackfoot people on these expeditions, the Spokane, Kulspelm and Kootanies generally forming a single party, with which, however, the Nez Perceés and Cour d'Alainés were sometimes united. On one of their expeditions these Indians met a party of Canadian trappers or Coureurs des bois at the eastern end of Hell's Gate Pass, near the site of the present town of Helena (Montana). The western Indians fraternized with these men, who joined with them in their hunt, and towards autumn, when the western Indians set out on their return, they were accompanied by two of the white men named Finan Macdonald[1] and Lagacé. These two men were guests of the Colville chief, who took them to his winter quarters at Kettle Falls, on the Columbia, at the north end of the Colville valley. Macdonald and Lagacé espoused the two daughters of their host and afterwards had children by them.

[1] Macdonald is mentioned by Ross Cox as having been in the employment of the Northwest Company in charge of a post among the Flatheads in 1812, so that the events here narrated must have occurred about the beginning of the century. See "The Columbia River," by Ross Cox, Vol. i, p. 172.

Late in the autumn Pila-ka-mu-la-uh went into winter quarters with his Similkameen wife at Penticton. He seems to have been a good *raconteur*, and from his vivid descriptions of the white men, their sayings and doings, became a centre of attraction, and was welcomed and fêted wherever he went. The Shuswaps invited him to Spallumsheen, where it took him a month to narrate all he knew about the whites. He was next invited to the Kuaut, Halkam and Halaut camps on Great Shuswap Lake, and, after spending a month at each of these places, he was further invited to Kamloops, where Tokane, the chief, gave him a grand reception. As the spring was now advancing into summer, and Pila-ka-mu-la-uh had not time to prepare for the summer buffalo hunt, he next accepted Tokane's invitation to spend the summer season at the Shuswap fishery at the foot of Pavilion Mountain, on the Fraser. He had there a new opportunity of relating his wonderful stories about the whites.

At one of the feasts given on his behalf by his host, he met the Stlat-limuh (Lillooet) chief of the Fountain band, who asked him to come to his camp at Fountain (*Hah-ilp*). Many strangers from the Fraser below Lillooet and from the lakes behind Lillooet collected at this place to hear the tales he told of the extraordinary people he had seen; but on one occasion, when he had nearly exhausted what he had to say, a chief from Seton Lake arose and advised the people to pay no more attention to these stories. The chief went on to declare that what they had heard must be false; that there were no human beings who had white skins, blue eyes, and light, short, curly hair, who covered themselves with woven material which kept them warm without encumbering their movements; that there was no weapon with which birds could be killed in their flight; that there were no shoes with which one could walk over cactus without being pricked, nor any such thing as a metal tube by which animals could be killed at a distance equal to the width of the Fraser; that no missile could be projected so fast that the eye could not follow it, and that there was no weapon which made a noise like thunder and at the same time produced a smoke like fire. He further denied that there was any animal on which men could ride safely and be carried faster than the swiftest buffalo. He said, in fine, that Pila-ka-mu-la-uh was a liar and should not be listened to by men and warriors.

This insult could only be avenged by the life of the offender, and Pila-ka-mu-la-uh, enraged, reached for his bow and arrows; but his opponent was too quick for him, and mortally wounded him with two arrows. His friends the Shuswaps bore him away to their camp, where he died. Before his death he expressed a wish that his son, N-kua-la, then a lad, should subsequently avenge his death, thus treacherously brought about.

At a later date the white traders established a post a Spokane, and formed outposts therefrom in different directions. One of these, in charge of a Mr. Montigny, assisted by a man named Pion, was placed on the peninsula between the two arms of Okanagan Lake, near its head. Here Mr. Montigny made a very successful winter's trade, and left with the returns in the spring, taking them to the coast. Before leaving he câched what remained of his trading goods, and left the whole in charge of N-kua-la, who had now grown to manhood and had become a chief of great importance among his people. On Montigny's return in the following autumn he found the goods safe, and rewarded N-kua-la for his fidelity by presenting him with ten guns, a suitable supply of ammunition, and some tobacco, pipes and vermilion.

During the winter N-kua-la trained the best men of his tribe in the use of the guns.

He had besides a horse which had been given to him by traders who had established themselves at Walla-Walla. Thus provided, he met the Shuswap, Thompson and Similkameen tribes in council, and invited them to join him in an attack on the Stlat-lim-uh (Lillooets) in revenge for his father's death. These tribes consenting to join him, they together, about the middle of the salmon season, and while the Stlat-lim-uh were occupied in fishing, fell upon them suddenly. Taken unawares, the Stlat-lim-uh were disconcerted by the noise and deadly effect of the guns and the appearance of N-kua-la on horseback riding from place to place and directing the attack. They fled, with little resistance, and over three hundred of them were killed, while many women and children were taken prisoners.

On his return from this raid N-kua-la gave a great feast to his allies in the Nicola, above the lake. To procure sufficient meat for this purpose, he drove a large herd of wapiti (which were then abundant) into an enclosure or pound, where they were killed with spears. The antlers of the animals killed at this time could, Mr. Mackay states, be seen in two large, well-built heaps as late as the year 1863. He is also said to have driven a herd of big-horn over a precipice near Stump Lake.

The assassination of Samuel Black, in charge of the Hudson's Bay Company's post at Kamloops, by an Indian of that vicinity, was a much later event in the history of the Shuswaps. This happened, according to Bancroft,[1] in the winter of 1841-42. It is referred to here in order to point to the circumstance that the occurrence has already become the centre of mythical stories among the Shuswaps, a fact which throws some light on the probable mode of origin of the various mythological and folk-lore stories of the people. The Indian who killed Black is said to have been named Kwā′-mis-kum, and he is reported to have escaped capture in various supernatural ways, till at length, being closely pursued, he drowned himself. Thus it is said that when he was camped near Tranquille (Til-kwo-kwē′-ki-la) he was completely surrounded, but coming out from his tent, jumped a prodigious distance over the heads of his pursuers, whose guns were unable to kill him. The impression made by his feet where he alighted may still be seen, and so on.

Mythology.

The following myths are all those which I have been able to obtain in proximately complete form. Several of them are already almost forgotten by the younger Indians, or, if not forgotten, they cannot be induced to speak of them. The fundamental story of the creation-hero in which the coyote figures is, of course, merely a variant of that common among the Indians to the south of British Columbia, with some versions of which we are already familiar. The most obvious points brought out in these stories of the Shuswaps is the prominence of the number four and the constant recurrence of the idea of a metamorphosis of men and animals to rocks.

Like most or all of the Indian people, the Shuswaps have a culture or creation-hero with supernatural attributes, but unlike Us-tas of the Tinneh tribes, who had the likeness of a man, the corresponding figure among the Shuswaps is a coyote or small wolf, named *Skil-āp′*. This is a proper name and not the ordinary designation of the coyote, which in this sense is called *sin-a-hoo′-ha-loop*.[2]

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[1] Bancroft's Works, vol. xxxii, p. 135.

[2] Both in the Shoo-whā′-pa-mooh dialect.

In the remotest antiquity, the country was peopled by Indians, but they were poor, because the salmon could not ascend the Fraser on account of a dam, which two old hags or witches had made where Hell-Gate Cañon now is. Skil-āp′ told the people that he would go down the river and break the dam, so that the salmon might come up. He instructed them to watch for a great smoke which he would make to show them when he had set out on his return. He then transformed himself into a smooth flat piece of wood, well shaped, and floated down the river till he lodged against the dam at Hell-Gate Cañon. Soon the women came to the dam to get salmon, and seeing the piece of wood said, "We will make a plate of this." They took the wood and three times put salmon upon it, but each time the fish disappeared, for Skil-āp′ ate it. They then became suspicious and threw the wood upon the fire, but no sooner had they done so than it began to cry like a child, and apparently turned into a man child, for they snatched it from the fire, and having washed and dressed it, proceeded to care for it. By degrees the boy grew, and the women always kept him tied up to prevent him from getting to the fire. But when the women went away Skil-āp′ used to feast on their salmon and other good things. At length, when on one occasion the women were absent, he put a hard covering of some kind on his head, so as to render himself invulnerable, and began to dig at and break down the dam. When his object was only partly accomplished, however, the women returned and assailed him with clubs, but were unable to hurt him. Thus he destroyed the dam, and when he had done so the salmon began to go up, tumbling one over the other, in great numbers. Then he followed the bank of the river, keeping abreast of the vanguard of the salmon, and making a great smoke by setting fire to the woods as he proceeded, so that the people knew that he was coming. Just below Savona (at the outlet of Kamloops Lake) he stopped to eat, and made there a dam or weir to catch some salmon at a place where some high rocks may still be seen.

When Skil-āp′ got as far up the Thompson as the mouth of the Clearwater, he found the people making a salmon-dam, and told them he would complete it for them. There to the present day are steep rocks on either side of the river, and above them is a large pool or basin where he fished with his scoop-net, and which is a noted salmon fishing place yet. On the rocks may be seen the prints of his feet where he stood to fish.

Thus the salmon were enabled to ascend into all the rivers of the Shuswap country.

It appears that Skil-āp′ is expected to return at some distant period when "the world turns" and the good old days come back.

Skil-āp′, it seems (of whose origin I was unable to learn anything definite,) had a brother, the fox (*Hō-āl-um*), whom he killed in order to possess his wife. Having done this he travelled off with the woman, singing "*Chō-lō-sē, chō-lō-sē*, I have killed my brother, and now I will kill all the people I meet." Soon he found some people and killed them, taking two more women. With his three wives he still travelled on and on, till at length the feet of the women became sore with walking. Then he rested two days, but his two new wives were still unable to travel, so he killed them and went on his way with the woman he had taken from his brother; but at last even she became footsore, and he killed her also. Still going on, but now alone, he came at length to a place where some graves were, and saying to himself, "I will take one of these people for a wife," he uncovered the body of a woman and lay down beside it to sleep. When he awoke he went out hunting and killed a fawn, which he brought and threw down,

saying to the dead body, "Get up and cook, here is meat;" but there was no response, and finding all his efforts to awake the dead useless, he struck the body, spoke contemptuously to it, and went on his way again, alone. Next he took to wife a short-tailed mouse, and with her lived some time, till she bore him a son named *Ska-tlalest*. But one day he found his new wife skinning a deer, and covered with blood in consequence. This made him angry, and he abused her and said, "Why do you not go outside," when she ran away and he was unable to find her again. It was after this event, according to my informant, that he set out on his expedition to open the way for the ascent of the salmon from the sea.

The end of Skil-āp′ is thus related. When at one time he was travelling up the south branch of the Thompson River, on the north bank, and had arrived at a place not far below the outlet of Little Shuswap Lake, he met a terrible being who ate men and appeared to be nothing but skin and bone. Skil-āp′'s son was with him on this journey. He told his son to sit down and wait, and advanced alone toward the cannibal, who was preparing to kill him. "Wait a bit," said Skil-āp′, "I also am an eater of men like yourself." The cannibal doubted this, but Skil-āp′ proposed that in order to prove it both should vomit. So they sat down opposite each other and shut their eyes. The cannibal vomited first and produced the half of a man. Skil-āp′ followed, but succeeded only in producing a mat which he had swallowed; but using his magic power he quickly transformed this into a portion of a human being "Now open your eyes," he cried, but just at this moment he and the cannibal and the boy, who was sitting at a little distance, were turned to stone. Thus ended the career of Skil-āp′, and the stones into which the trio were changed may still be seen, two resting close together and the third, representing the boy, at a little distance.

The following story relating to Skil-āp′ is communicated by Mr. J. W. Mackay. It is derived from the Indians of the vicinity of Lytton, and while resembling some of those obtained by myself, it differs in several points from these. I retain Mr. Mackay's spelling of the proper names :—

Sin-ka-yap (Skil-āp′) came to the world or ground or country before man. He was like unto a man with wings, and made man and everything upon the earth. At one time he saw a tree, and in the tree was a nest upon which was a beautiful bird. He told *N-kik-sam-tam*, his son, to climb the tree and obtain the bird for him. N-kik-sam-tam had two wives, and one of these Sin-ka-yap wanted. When N-kik-sam-tam began to climb the tree, Sin-ka-yap caused it to grow higher, and therefore N-kik-sam-tam could not reach the nest, but became tired and wished to return to the ground. Sin-ka-yap, however, encouraged his son to go on and told him he would soon get to the bird, and the son persevered, while the tree grew till at length it reached the sky. There N-kik-sam-tam found himself in a strange country, where he met two old men whom he had known on the earth before they died. He asked them how he could get back to the earth, and they said that they would make a long rope and lower him down. This they did, and also constructed a basket, which was fastened to the rope, hanging by four corners. They then told N-kik-sam-tam that in descending he would reach four different regions or places. One, they said, will be wet; that is not the earth. One will be cold; that is not the earth. One will be foggy; that is not the earth. But when you hear the

crows cawing you will be near the earth. You must then sway the basket, and we will let you down gently. N-kik-sam-tam reached the earth thus at Tl-kam-cheen (Lytton), and the stone upon which he descended may still be seen. A large number of people were going from Lytton to Botanie at the time he came down. He joined the crowd and went with them, following one of his wives who had been true to him, while the other had abandoned him for his father. When they reached Botanie the woman turned round and recognized him, and the two afterwards lived together.

Though Sin-ka-yap is found described above as a man with wings, it is recognized that he was also the coyote in some way.

Besides Skil-āp′, there were at the same early time other supernatural beings or demi-gods who roamed the world, and of these the most important was named *Kwil-ī-elt′*. It may be that in the stories related of Kwil-ī-elt′ and Skil-āp′ we find the mingling of mythological ideas among the Shuswaps, derived from two different sources, and this is a point deserving enquiry.

Kwil-ī-elt′ had no recognized father nor any other relative but his mother, and was the offspring of the union of the woman, his mother, with a root which is eaten by the Indians for food and is named *kō-kwe′-la*. His name is a synonym of the ordinary name of this root and signifies "the straight." The root in question grows on the borders of rivers and streams.[1] When the son Kwil-ī-elt′ grew up, he became a great hunter and killed many deer for his mother, who lived at Kwi-kooi′, at the lower end of Adams Lake. He often asked his mother who his father was, but she was ashamed of the union which had resulted in his birth, and told him his father was dead. Now it happened that he passed by a root of the kō-kwe′-la, and it made a peculiar sound. This he noticed three times, but could not see what made the sound; but a fourth time he spied the root, and it said "I am your father." This made him so much ashamed that he went back to the lodge and lay down there three days without speaking a word. After this he rose up and went out hunting, and when he had brought in a good store of meat, he bitterly reproached his mother, and told her that he was about to go away and would never return to her. His mother then told him of all the evil and malignant monsters which at that time lived in the country further down the river, and he formed the resolve to extirpate them.

When Kwil-ī-elt′ left his birthplace in this wise, he travelled down the Thompson River and then up the Fraser, coming at last to the place where his career ended in the manner subsequently related. Most of his wonderful deeds were performed on that part of the Thompson between the lower end of Kamloops Lake and Spence's Bridge. When on his way, not far below Kamloops Lake, two brothers who were of the same old supernatural character as himself, spied him. These were named *Klō-sa* and *Took-im-in-ōlst′*. They said, "We will have some fun with this traveller;" and as he was passing along the edge of the river, by way of a joke, they kicked down a huge piece of the hillside upon him. But when the great dust which arose cleared away there was Kwil-ī-elt′ unhurt and walking along quite unconcerned. Four times the brothers repeated this trick, but always with the same result, and the last time Kwil-ī-elt′ spoke, saying, "What are you trying to do, you cannot injure me." Then the three held a conference together and formed a pact, becoming as brothers and banding together for the purpose of making

[1] The plant was not identified.

things right in the world and destroying the monsters which lived in it. It appears also that Kwil-ī-elt′ met Skil-āp′ when the latter was on his way to open a passage for the salmon up the Fraser, and that Kwil-ī-elt′ with his two friends and Skil-āp′ held a feast together and arranged what routes they would respectively follow, after which Kwil-ī-elt′, Klē-sa′ and Took-im-in-ēlst′ parted from Skil-āp′, who never met them again.

Many stories are related of Kwil-ī-elt′ and his two friends, amongst which are the following:—

A trial of strength was arranged, Kwi-ī-elt′ proposing that each should push his head against a rock and see which could make the deepest impression. Kle-sa′ and Took-im-in-ēlst′ tried first, and each managed to make a shallow impression, but Kwil-ī-elt′ followed and pressed his head in to the shoulders. This happened at a place near the mouth of Hat Creek, and the name of this stream as now given is derived from this story, and from the circumstance that the impressions made in the rock at this time are still shown by the Indians.

At another place there was an eagle monster which killed men. Kwil-ī-elt′ proposed to attack it. He had concealed about him a stone weapon of some kind, and unknown to his two friends had filled one side of his mouth with red paint, which he had brought with him or obtained from the paint locality mentioned as existing on Adams Lake. The other side of his mouth was filled with white earth. When he approached the eagle, his friends watching, it swooped down on him, and seizing him by the head in its claws, carried him up to a high rock, against which it endeavoured to dash him. Kwil-ī-elt′, however, warded off the blow by means of his weapon, and at the same time spat out the red paint on the rock. His friends said, "He is dead, see his blood." The eagle again attempted to dash him on the rock, whereupon he spat out the white earth, and his friends said, "See his brains." Then the eagle, also thinking him to be dead, carried him to its nest, where two eaglets were, but Kwil-ī-elt′ struck the eagle with his weapon and killed it, and told the eaglets, which could already fly, that they must take him down to his friends, to the very place where he had left them. This they were obliged to do, one supporting him under each arm. Then he pulled out their tail-feathers, saying, "Be you only common eagles, able to harm no man," and let them go. I did not ascertain to what place this story is affixed.

At the outlet of Kamloops Lake there was an elk monster, which lived in the middle of the river and killed and ate men. Kwil-ī-elt′ made a raft, while the others looked on as before. This done he embarked and floated down the stream, when, before long, the elk seized and swallowed him. His friends again thought they had seen the last of him, but Kwil-ī-elt′ stabbed the elk in the heart with the weapon he carried, and then cut his way out of its belly and came to shore, bringing the elk with him, and inviting his friends to eat some of the meat. As to the elk, he reduced it to its present position, saying to it, "You will no longer kill men, they will in future always kill you."

Next the two friends of Kwil-ī-elt′ told him that there were two bad women or witches, with supernatural powers, on the Thompson, about four miles further down that river, who danced there upon a high rock, and that people passing by who stopped to look at them were turned to stone. So Kwil-ī-elt′ went to the place, and after watching the women dance for some time, changed them into two rocks, which are there to this day.

The badger was also in this early time a formidable monster, and had its lodge stored with dead men, collected for food. Kwil-ī-elt′ caught the badger, and striking him on the head said, "Hereafter you will be nothing but a common badger, able only to fight with dogs when they attack you." He further brought to life again all the people whom he found dead.

When Kwil-ī-elt′ and his two friends had travelled some way up the Fraser valley, though I was unable to learn how far, they saw four women dancing together on a high rock. These women were also witches, and Kwil-ī-elt′ proposed to deal with them as he had the others, but his companions persuaded him to watch them dancing for a time, as they were very fine-looking women. Kwil-ī-elt′ sat down for this purpose, but no sooner had he done so than he was turned to stone, for the magic power of the women was greater than his. Next his two friends were likewise changed to stone, and the three rocks stand at the place yet. Such was the end of Kwil-ī-elt′ and his friends.

It is probable that each subdivision of the Shuswap people attach these stories to different localities, or that some of them at least are assigned to varying localities. As related above, the localities are those given by the Kamloops Indians. The Indians living at Lytton appear to place the story of the attempt of Klō-sa and Took-im-in-ōsl′ on Kwil-ī-elt′'s life at the Big Slide, between Spence's Bridge and Nicoamen. At least a very similar story is told of this place, and the impression of a human form of gigantic size is pointed out on the cliff on the opposite or west side of the Thompson, as that made at the time when the slide came down. Another informant placed the site of this encounter near the mouth of Hat Creek, on the Bonaparte.

On the trail which leads from Kamloops toward Trout Lake (*Pīp′-tsutl*), where it runs over the bare, grassy hills about a mile north of the crossing place of Peterson or Jacko Creek, the scanty remnant of an old stump protrudes from among a few stones which are piled about it. In passing this the Indians always throw some little offering upon it. When I saw it in 1890, several matches had recently been laid on the stump, and a fragment of tobacco or shred of clothing is often placed there. The name of this place is *Ka-whoo′-sa* ("crying"), and the Indians say that it nearly always rains when they pass, as though the sky wept. The story attaching to it is as follows:—

Long ago there was an old woman who was called, or represented in some way, a grizzly bear, and who had neither husband nor children and was very lonely. For the sake of companionship she procured some pitch and shaped from it the figure of a girl, which became her daughter. She strictly enjoined the girl, however, that when she went into the water to bathe she must not thereafter sit or lie in the sun to get warm. This special order the girl obeyed on three occasions, but on a fourth, overcome with curiosity and not understanding the reason of the injunction, she sat down on a stone in the sun, and so before long melted with the heat and disappeared. Then the old woman made a girl out of clay, and this time told her daughter that she might bathe and dry herself in the sun if she pleased, but must on no account rub herself when in the water. Three times, as before, the girl obeyed, but on the fourth disobeyed and rubbed herself away in the water and was lost. So again the old woman was alone, but she bethought herself, and next made a daughter out of a piece of wood, telling this one that she might bathe, swim, bask in the sun or do what she pleased. Three times the girl bathed without incident, but on the fourth, as she sat on the bank of the river with her back partly turned

toward it, drying herself, she saw a fine large trout jump, and exclaimed, "I would like well to have that fish for my husband." Twice again the trout jumped, and she repeated her wish, but on the fourth occasion she felt something touch her back, and turning round saw a fine young man standing beside her, who said, "You wished me for a husband; now I am come to take you." She readily consented to go with him, so he took her on his back and told her not to open her eyes till he gave her permission to do so. Then he sprang into the river and dived toward the bottom, but half way down the girl opened her eyes, when instantly she found herself on the bank again. This occurred three times, but on the fourth trial she managed to keep her eyes closed till her lover ordered her to open them. Then she found herself with her lover in a good country, something like that which she had left, but not the same.

In this country the two lived for some time, and two children were born to them, a boy and a girl. There were other people in this under-water country, however, and when the children began to grow large they were taunted by being told that they had no grandmother, and came to their mother to ask her why this was. She told them that they had a grandmother, but that she lived in the upper country. They might, if they pleased, go up there, and if they did so would see an old woman digging roots on the hillside who was their grandmother. They were not to speak to her, but might go to her house and take there whatever they could find to eat. This pleased the children, who accordingly thrice went up to the upper country, and each time having noted the old woman to be hard at work on the hill, went to her house and helped themselves to food. The woman, however, when she returned from her work, found that food had been taken and saw the footprints of the childen, and said to herself that none but her daughter's children would visit her house in that way. So she prepared some potent "medicine," and then going to a stump on the hillside where she was accustomed to work, told the stump that when the children appeared it must move and seem to be a woman digging. The woman then concealed herself in the house, and when the children came the stump acted as she had bidden. The children spied about, and the boy was satisfied that he saw the old woman at work on the hill, but the girl was suspicious, so the boy went first alone to the house, but soon he persuaded his sister to follow him. As soon as both were in the house the woman threw the medicine upon the children. It fell all over the boy, but only a part reached the girl, and so the former was changed to an ordinary human being, while the girl became a little dog.

The woman kept the boy, whose name was *Ta-kutl'-pie'-e-has'k*, and the dog, and took care of both, but the boy did not know that the dog was his sister, and the women never told him this, but bade him on no account to beat or ill-use it. The boy soon began to shoot with a bow and arrows, and one day was shooting the red-headed woodpeckers. Three times he killed one of these birds, but each time the dog ran on before him and ate the bird. Then he became angry, and when the same thing happened a fourth time he struck the dog, beating it with an arrow. Then the dog spoke, saying, "Why do you beat me, your own sister?" and ran from him. The boy followed, but before he could catch the dog it turned into a chickadee and flew away. Very sad, the boy returned to his grandmother and asked her why she had not told him that the dog was really his sister, but she said to him, "If I had told you perhaps you would be more sorrowful than you now are." She then went on to tell the boy, that if when shooting, his arrow should

happen to lodge in a tree or anywhere above his reach, however little, he must not climb up to get it. Soon afterwards he three times lost arrows in this way, but a fourth time his arrow stuck in a tree not far up, and he climbed on a branch to get it; but the arrow continued to move further up, and he had to climb after it, and though he thought he had not gone very far, he looked down after a time and found that he could not even see the earth. So he went on climbing, the arrow still going before him, till at last he reached another country above, which was very pleasant and in which many people were, and there he remained. Now the old stump first mentioned is the remnant of this very tree.

Various materials were employed by the Shuswaps for the manufacture of arrow-heads and spear-heads, including jasper, quartz and cherty quartzite, but that most commonly used was a species of imperfectly vitreous obsidian or, strictly speaking, an augite-porphyrite. This is particularly abundant in the Arrow-stone Hills and about the upper part of Câche Creek. The origin of this pre-eminently important arrow-stone is thus explained. Kwil-ī-elt′ and his friends, at one time in the course of their journey, decided to go in quest of arrow-stone, which was then in possession of two old women who lived somewhere near Câche Creek. Having found the old women, they told each that the other misrepresented her in some way maliciously, until both became enraged and began to fight. As they fought the arrow-stone fell from their clothes or persons in great quantity. Finally they told the women that they had been deceiving them for the purpose of obtaining the arrow-stone. The women then asked the associates why they had not frankly told them what they wanted, and so saying produced boxes full of fine pieces of arrow-stone, as well as of finished arrow-heads, and presented these to them. The associates then scattered these over the country, where the arrow-stone has ever since been abundant.

There is a story about the sun of which I failed to procure particulars, but which appears to have some connection with the history of Skil-āp′. It is said that the coyote was at one time placed in the sky for the sun or in charge of the sun, but that he called out aloud whenever he saw an Indian stealing or misconducting himself below. This was so inconvenient that he was deposed in some way. Some other being was then placed in charge, but with him the sun was much too warm. Lastly a third custodian was appointed, and since then all has gone well.

Once a mosquito, gorged with blood, flew far up where the thunder is. The thunder asked the mosquito where it got the blood, and the mosquito falsely replied that it was sucked from the buds at the very top of the trees below. Hence the reason that the thunder (lightning) strikes the tops of the trees.

Stories Attaching to Particular Localities.

The traditions and fables here included are not strictly separable from those above given, as nearly all the mythological incidents are localized by each tribe, and in most cases the places pointed out are different in each instance.

The following story relates to *In-pa-āt′-kwa-ten*, or Pavilion Lake, in Marble Cañon, the water of which has a peculiar blue tint. Very long ago, the skunk was married to a short-tailed mouse, and the eagle stole away the skunk's wife. The skunk, seeking the culprits, came to the lake, and thought he saw them in the bottom, though in reality the

eagle and the mouse were sitting on a crag above the lake and the skunk saw only their reflection in the water. The skunk, however, ejected his malodorous secretion into the lake several times, till he had exhausted the supply, when looking up at last he was chagrined to see the pair laughing at him for his pains. Ever since this time the lake has had its present peculiar colour.

Pīp'-tsutl or "Trout Lake," situated about fifteen miles south-south-west of Kamloops, is said to have been a resort of the "water people," who are spoken of under the same name as those of Adams Lake. It is also said that in this lake, when the Indians are spearing fish by torchlight, they can see in the bottom a cleft, from which great numbers of fish come out, but all are imperfect or half-fish wanting the tail end. Long ago the old people used to catch these half-fish, but the water is so deep that they can never spear them now. A similar story is told of the lake at the head of Edwards' Creek, a tributary of the North Thompson, and here also are "water people." These, on fine, calm, warm days have been seen to the number of two or more floating upon the surface asleep. "Water people" are also said to have inhabited Stump Lake, south of Kamloops.

Nearly all the large lakes in British Columbia, whether in the regions inhabited by the Shuswaps or Tinneh, are reported to contain or to have contained monsters of some kind. Thus Adams Lake was inhabited by two "water people," a man and a women. These are said to have been about twice the size of ordinary human beings, with human heads, long hair and tails like fish, the description agreeing with that ordinarily given of mermen or mermaids. Their particular abode was at the foot of a cliff on the east side of the lake, about five miles from its lower end, where it is said a hole may be seen below water which served them as a doorway. Indians were afraid to pass this point in canoes, as when doing so the winds frequently arose in consequence of the malign power of the "water people," and canoes were swamped and the occupants drowned. At last, so the story runs, the Indians made a combined onslaught on these "water people," shooting arrows at them from the lake and at the same time rolling stones into the upper aperture of the cave or fissure which they inhabited, which it appears was somewhere on the hill above. After this a very strong wind blew over the lake for four days, and then the "water people" were seen taking their departure down Adams River, one going thence in the direction of Kamloops, the other to some place in the vicinity of Copper Island, on Great Shuswap Lake. These "water people" are known by the name of *kul-a-moo-whot'-kwa*, with the above meaning.

I had previously (in 1877) heard from the Indians that a monster or monsters of some kind lived about Copper Island. Mr. J. McEvoy subsequently ascertained that here also habits similar to those attributed to the "water people" of Adams Lake were given to those of Copper Island. It is stated that they were here killed by three wood-peckers. The "water people" at first took refuge in a cave which opened below the level of the lake. The first wood-pecker, the red-naped sap-sucker (*Tsu-kwa'-kwī-ox*) tried to split the rock but failed. Next the flicker (*Tsuk-tsu-kwasp'*) tried and failed. Then the pileated wood-pecker (*Tsuk-we-kain'*) struck the rock a great blow, when it split open and all three joined in destroying the "water people."

The "water people" are also said to have haunted the vicinity of Battle Bluff, on Kamloops Lake. The Indian name of the bluff is *Hoom-a-tat'-kwa*.[1] It was dangerous for

[1] The same name is applied to Copper Island, previously mentioned, but means merely "in the middle of the lake."

canoes to pass because of the "water people," who in this instance are described as of human shape, but hairy in the upper half, with fish-like tails below. It is also told of this bluff that some hostile people once coming by land to attack the Kamloop Indians, looking down over the front of the bluff as they passed, saw a woman or witch dancing in a niche part way down the cliff. They sat down on the edge of the cliff to watch the woman dance and were there turned to stones.

Little men called, as ascertained by Mr. McEvoy, *Tsu-in-ī-tem*, are reported to exist in several places. The most noted locality is Big-horn Mountain (*La-te'-kwil-e-ken*), situated twenty miles down Okanagan Lake, on the west side. They hunt with bows and arrows; and while represented as being only two feet high, yet they are able to carry a deer easily. In contrast to this, when a squirrel is killed they skin it and take only a part, as the whole is to heavy for them. The Indians are very much afraid of them.

The bluff rocky point which comes out on the north side of the South Thompson River, nineteen miles above Kamloops, is named *S'k-a-mā-mĭnk*, or "big belly." It is said to represent a woman with child who was turned to stone by Kwil-ī-elt'. Paul's Peak, near Kamloops, is similarly said to have been a man who was turned to stone by the same old hero. The name of the man was *Tk-kul-ti-kālst*. The smaller hill in front of the main summit was a woman. The two prominences represent her breasts, and the name of the hill is *Skuk-a-ā*^{m}, or "the breasts."

The Indians say that on the mountain named Tshin'-a-kin, or "shoulder-blade," with notable, broad, bare surfaces of white limestone, on the east side of Adams Lake fourteen miles from its lower end, they often see the footprints of a child when they hunt, but can never follow these up so far as to ascertain what makes them.

The curious and prominent point on the plateau south of Bonaparte Lake named *Sko'-whoatl* (Skoatl on map) is the object of some superstitious veneration or dread. Indians going to fish in the lakes near it blacken their faces to propitiate the local evil influence. Its name simply means "the pointed" or "upstanding." It is further supposed that an approach to this place is likely to produce rain and stormy weather. The same idea attaches also to Vermilion Bluff, on the Tulameen River, already mentioned.

It is stated that somewhere in the high mountainous country not far from Za-kwās-ki, there is to be found the perfect representation of a boat in stone, with three Indians sitting erect in it, also in stone. None of those I spoke to seemed to know exactly where this was, but one man volunteered the suggestion that there must at some time have been a great flood, after which the boat stranded.

The west branch of the Barrière River is named *Sas'-kum* or "open mouth," from a story which relates that a dog was there turned to stone, and may still be seen somewhere with mouth open.

The Kamloops Indians affirm, that the very highest mountain they know is on the north side of the valley at Tête Jaune Câche, about ten miles from the valley. This is named *Yuh-hai-has'-kun*, from the appearance of a spiral road running up it. No one has ever been known to reach the top, though a former chief of Tsuk-tsuk-kwālk', on the North Thompson, was near the top once when hunting goats. When he realized how high he had climbed he became frightened and returned.

Pavilion Mountain was so named after a chief of considerable renown, whose authority was widely acknowledged. He flourished about the time of the first gold excitement,

when the whites entered the country in large numbers. His true name was *Kwēm-tshahen*, or "rainbow," and Sir Matthew Begbie is credited with having given him his "English name." Pavilion.

Superstitions.

The Shuswaps, like all other tribes, practised "medicine" or sorcery for the cure of disease. They had recognized medicine men named *Tluh-kwī'-lih*. These sang and danced round the patient, and endeavoured by sucking and manipulation to extract the cause of the illness or suffering. At times they would produce some small object as being the cause.

The custom of leaving little offerings of some kind at certain places, already mentioned, is not uncommon. There is, I was informed, a heap of stones on Whipsaw Creek, not far below Powder Camp and on the route between the Similkameen and Hope, to which everyone must "pay" something when passing, by putting a stone or twig upon the cairn.

The Indians aver that unknown beings sometimes throw stones at them, particularly at night, when stones may be noticed occasionally falling into the fire. A Kamloops Indian, long since dead, once saw a white object following him by night. He drew back from the trail and shot an arrow at it as it passed. In the morning he returned and found his arrow buried in a human shoulder-blade.

It is believed that burning wood from a tree which has been struck by lightning brings on cold weather. This appears to be based on the fact that cold follows a thunder storm. Thus, in the spring, when Indians may be travelling over the snow on high ground, splinters of such wood are thrown into the fire to reduce the temperature in order that the crust may remain unmelted on the snow. A small splinter of such wood wrapped up with the bullet in loading a gun greatly increases the deadly effect of the bullet.

Parnassia fimbriata is accounted good "medicine" for the deer-hunter. The plant is to be worn in the hat or rubbed on it and on the soles of the feet, which makes it certain that the deer will be seen and caught. The rattle of a rattle-snake worn in the hat is a preventive against headache.

With reference to a small lizard the Indians have a singular superstition, viz, that a man seeing one of them is afterwards followed by it wherever he may go during the day, till at length, when asleep during the following night, it finds him, and, entering his body by the fundament, proceeds to eat out his heart, which naturally results before long in his death.

The late Mr. Bennett of Spallumsheen told me, in 1877, that the Indians employed by him in making a ditch for purposes of irrigation, on coming into camp in the evening would jump several times over the fire in order to lead the possibly pursing lizard to enter the fire and be destroyed in attempting to cross. He also noticed that they carefully tied up the legs of their trousers when retiring. If while at work during the day they saw one of these little lizards, which appeared to be abundant in this locality, it would be caught in a forked twig, the ends of which were then tied together with a wisp of grass and the butt end of the twig afterwards planted in the soil. Thus treated the lizard soon died and became a natural mummy. If during the progress of the work

anyone found and carelessly tossed aside one of these lizards, the Indians would throw down their tools and search diligently till they found and secured it in the above manner.

This superstition must be well known and widespread among the Indians, for it was afterwards related to me in identical form by a man of the Nicola River, who further pointed out to me a small lake, singularly situated on the summit of a high ridge about a mile and a half south of the mountain named Za-kwās'-ki, as a noted resort—possibly the only place known to him—where this peculiar little animal was found. He described it as being a few inches in length and nearly black. Za-kwās'-ki, to which other stories attach, is south of Nicola River, at the source of the Nicoamen River.

The story of the existence of a kind of rattle-snake with a head at each end is common among the Shuswaps, and several men I have met actually say they have themselves seen such snakes. The name of this creature is *wha-tloo'-sil-i-kin.* To see such a snake is very unlucky and portends the death of some near friend. Most of the accounts given refer to the South Thompson valley, but the vicinity of Vernon, on Okanagan Lake, is also mentioned. It is interesting to compare this idea with the belief in the Sī-sī-ootl or double-headed snake, entertained by the Kwakiool of Vancouver Island.

The owl is a bird somewhat dreaded, and is said to haunt camps where some one is dead, or in which are the relatives of some one who has died elsewhere, saying Too! too! A-sum'-tshak'-is, "he is a long time dead." This is evidently a fancy based on the resemblance of the owl's note to the words in question.

The grizzly bear is said to have in old days been a much more formidable creature than it is now, constantly attacking and killing Indians. This probably means merely that the Indians are now better armed, and possibly implies also that the bears have become aware of this circumstance.

Names of Stars and of the Months.

The Pleiades are called by the Shoo-whā'-pa-mooh *hu-hā-oos*, or "the bunch," and also *kul-kul-stā-tim*, or "people roasting." The last name is given from a story of their origin, which relates that a number of women who were baking roots in a hole in the ground, as is their fashion, became changed into this group of stars.

The morning star is named *chī-whī-looh-tān'*, or "coming with the daylight," also *wō-pk-ā'*, or "one with hair standing out round his head."

The four stars which form the quadrilateral of the Great Bear are, singularly enough, known to the Shuswaps as the bear stars, *kum-a-koo-sas'-ka.* The three following large stars are three brothers in pursuit of the bear. The first hunter is brave and near the bear, the second leads a dog (the small companion star), the third is afraid and hangs far back.

The stars of Orion's belt are named *kut-a-kīkt'-la*, or "fishing."

The milky way is named *chiw-ī-wī-ow'-is*, the road or path of the dead.

The aurora borealis is named *sīs-ă-am*, which appears to mean "cold wind," but this is uncertain.

The Stā'-tlum-ooh (Lillooets) call the Pleiades *in-mōx'*, meaning the "bunch" or "cluster;" the Great Bear *mī-hātl'*, the name of the black bear.

The face of the moon is said to represent the figure of a man with a basket on his back, and the name of this man is *Whā'-la.*

A month or moon is named *mā-hin* by the Shoo-whā′-pa-mooh, and the names obtained for the months in order are as follows, beginning about March. The meanings assigned are not in all cases certainly correct, though the most explicit I was able to obtain from my informant:—

Pīs-kāpits′, "spring."
Pīs-whī-a-whoom, "grass month."
Pit-la-kāt′-lai-a-hin, "root-digging" month."
Pil-tā-pānsk′, "strawberry month."
Kal′-kul-tum-ah, "berry month."
Pil-tum-hlīk′, "salmon month."
Pil-ta-klēlahin′, "month when the salmon get bad."
Pil-tloo-alītstin, "month when the deer travel."
Pil-whatl-ootlin, "month in which they return from hunting."
Pil-kwootl-a-mīn′, "remaining at home month."
Pil-ta-tē′-a-kum, "midwinter month."
Pil-tshik′-in-tin.

List of Two Hundred and Twenty Place-names in the Shuswap Country, British Columbia.

(1.) Shuswap Names of Places on the Kamloops Sheet of the Geological Map of British Columbia

Indian Name.	*Name adopted, or description of place on the map.*	*Meaning given for Indian name.*
A-kāz-ik	A-kāz-ik Mountain	
As-kōm′	As-kōm′ Mountain	The mountain.
Bōtānie	Bōtānie Lake, etc.	Perpetual root-place?
Hei′-in-wolh	Deadman River	Circling or detour.
He-mām′-sitl	Big Fish Lake	Big trout?
Hī-āh′-kwa	Hī-āh′kwa Lake	Long lake.
Hi-hium′	Hi-hium Lake	Trout lake.
Hloo-lĕu	Lac le Bois	Diver lake.
Hoom-it-ā′-lis	Stony Creek	
Hūm-ilt-kwē′-ilt	Small lake below Big Bar Lake	Young fish lake.
Hup-hāp′	Hill on west side Copper Creek	Slaty.
Hut-tsat-tsl	Old village site near Kelley Lake	Cold spring.
I-īs	Campbell Creek	
In-hā-hōt′	Eighteen-mile Creek	Dry.
In-ka-kēn′	Mountain 4 miles north of Za-kwas′-ki	
In-ki-kuh′	In-ki-kuh′ Creek	Sometimes dry.
In-koi′-ko	In-koi-ko Creek	
In-pa-āt′-kwa-ten	Pavilion Lake	
In-skwa-tām	Red Creek	Red.
In-tl-pam	In-tl-pam Creek	Deep.
In-toi-a′	In Marble Mountains	Overhung Mountain.
In-whois′-ten	Bridge River	
Ka-ka′-kowes	Pass Lake	
Kil-a-paus′	Upper part of Scottie Creek	
Kit-sa-min′	Edward Creek	Drift pile.
Klā′-hāl	Loon Lake	
Klim′-la-la-me	Medicine Creek	Medicine.
Kl-ow′-a	Kl-ow-a Mountain and Creek	Green.
Kluh-tows	Bonaparte River	Gravelly river.
Kōk-lā-kā	Shumway Lake	
Kuk-waus′	Kuk-waus′ or Bonaparte Lake	Spear-head lake?
Kwil-āl′-kwila	Green Mountain	Green mountain.

(1.) SHUSWAP NAMES OF PLACES ON THE KAMLOOPS SHEET OF THE GEOLOGICAL MAP OF BRITISH COLUMBIA.—*Continued.*

Indian Name.	*Name adopted or description of place on the map.*	*Meaning given for Indian Name.*
Kwin-tsha′-ten	Small stream joining Nicola above Skuh′-un	
Kwio-hau'k	Cairn Mountain	Open or clear.
Kwōm′-a-kun	Skull Hill	Skull hill.
La′-loo-wisin	La′-loo-wisin Creek	
Ma-mīt	Mamit Lake	White fish.
Me-toots′	At forks of Bonaparte	Projecting point.
Na-ai-ik	Guichon Creek, mouth	Bearberry (*Arctostaphylos*).
Na-kwās′-tam	Eleven-mile Creek	Deep.
Ne-kin-ish-tam′	Chasm Creek	
Ne-wil-whoos	Ridge Lake	Ridge lake.
Ni-a-an′-tun	Botanie valley as a whole	
Ni-kow-men	Nicoamen River	
Ni-hlip-tow′-us-tum	Small stream next above Kelley Creek	Going over stream.
Nim-nim-wh′	Mountain 4 miles north-east of Za-kwas′-kī	
O-o-pax′	Opax Hill	
Pe-tloosh-kwo-hap′	Pe-tloosh-kwo-hap′ Mountain	
Pi-mai-nus	Pimainus Creek and Lakes	
Pīp-tsutl	Trout Lake	Trout.
Pis-ī-tsoots′-ī-a	Porcupine Ridge	Porcupine place.
Pis-kī-kī-al	Small lake near Ridge Lake	Chief-hare ?
Ptl-mā′-mī-a	Fly Creek	Blue-bottle fly.
Ptl-nīl-min	Poison Hill	Poison weed (*Veratrum*) place.
Ptl-tik-moos′	Young Lake	Sucker.
Puh-hā′-ha-nih	Ridge running west from Cairn Mountain	
Pukaist	Pukaist Creek and village	White.
Pu-kō′-kila-hoom	Big Bar Lake	Deep, with shallow margin.
Put-hil-i-hīl	Three-lake valley	*Potentilla anserina.*
Shaw-ow-itlan	Mouth of Jamieson Creek	The portage.
She-kŭk′-ilwh	Lower part of Sandy Creek	
Shit-shoos′-tl	Allen Creek	It dries up.
Shloot	Fraser River near Leon Creek	The eddy.
Shoopem-hāt′-kwa	South Thompson	Shuswaps' river.
Sil-whoi′-a-kun	Sil-whoi′-a-kun	Caribou place.
Sin-po-āt′-kwa	North Thompson	North river.
Sī-o-kŭm	Traps Lake	
Sitz-kwōk′-sum	1½ mile below Leon Creek	Looking up.
Si-whe′	Si-whe′ Creek	
Skem-a-kaim′	Lower end of Seton Lake	
Skī′-hist	Skī′-hist Mountain	
Ski-kloosha	Face Lake	Face.
Skoon-kō′	Skoon-kō′ Creek	
Skoo-talis	Hills between Thompson, Bonaparte and Câche Ck.	
Skoo-wat′-kum	Skull Creek	
Sko-whautl	Skoatl Point	Pointed or upstanding.
Skuh′-un	Skuh′-un Creek	Stony.
Skuk′-e-uke	Mountain 3 miles north-north-east of Za-kwas′-kī.	Thunder hill.
Skup-kak-wa	Sandy Creek	Sandy.
Sku-skul-a-hāt′-kwa	River Lake	
Skutl-hēh′-tl	Gnawed Mountain	Eaten to the bone.
Skwil-ā′-tin	Kelley Creek, lower part	Big hill.
Skwil-kwa′-kwil	Skwil-kwa′-kwil Mountain	The highest.
Spa-āīst	Spaist Mountain	Burnt.
Spāp-sil-kwa	Glen Hart	The lakes.
Spa-tsin′	Spa-tsin′ Lake	Burnt lake ?
Spēp′-sum	Spatzum	*Asclepias speciosa.*

(1.) Shuswap Names of Places on the Kamloops Sheet of the Geological Map of British Columbia—*Continued.*

Indian name.	*Name adopted, or description of place on the map.*	*Meaning given for Indian name.*
Spi-al-hw.	Eagle Hill	Eagle.
Spilim-ăt′-lē-la.	Near mouth of Câche Creek	Brook at the flat.
Spil-mā-moos	Maiden Creek	Little flat.
Spīl-pāl′-um	Clinton Creek	Prairie flat.
Spit′-poo-tlum	Marble Cañon	Narrow valley which opens.
Spit-ti-kwous′	Pass from Hat Creek to Jack's Creek	The defile.
Stā-ai′-in *or* Ste-in	Stein Creek	
Stlim′-what-kwa.	Fraser River near Lillooet	Lillooet's river.
S'tl-pō′-mun	Upper part of Hat Creek valley	Opening out.
Swuz-uk-ain′	Botanie Mountain	
Tai-a-ka	Tai-a-ka Lake	
Ta-tlh.	Small stream 1 mile north of Fourteen-mile Creek.	
Ti-nā′-mia	Stump Lake	
Tik-ī-māx′	Tranquille River	Point (river).
Til-kwo-kwē′-ki-la	Tranquille River, near mouth	Name of a root.
Til-kwa-sī-shoo	One of the Red Lakes	
Titl′-whiloom	Three-mile Creek	
Tlirt-lī-put-ām′	Macaulay Creek	Balsam-spruce ravine.
Toon-kwa	Toon-kwa	Goose lake.
Tow-il-ta-kaī	Eight-mile Creek	Mountain brook.
Tshi-it′-lin-stum	Eating Lake	Eating.
Tshil-tshitl′-nuts.	Lakes in Highland valley	Slightly saline.
Tshi-mīmt-sim	Blue Ravine	Washed out.
Tshi-poo-in	Summit of pass near Chī′-poo-in Mountain	A câche in the ground.
Tshi-wō′-us	Mountain 3 miles north of Za-kwas′-kī	
Tsho-ha-mous	Cayoosh Creek	
Tshoo-loos′	Name applied to Guichon Creek	
Tshoo-whēls′	Choo-whēls′ Mountain	Many ravines.
Tshŭ-tshŭ.	Murray Creek	
Tsi′-kwus-tum	Câche Creek, lower part	Cracked rocks.
Tsil-tsālt	Tsil-tsālt Ridge	
Tsin-tsoon′-ko	Tsin-tsoon′-ko Lake	Island lake.
Tsoo-tsi-wowh	Lytton Mountains	Streams.
Tsoo-weh′	Texas Creek	The stream.
Tsot-in-aut-kwa	Tsotin Lake	Rattlesnake lake.
Tsuk-ă-tā′-tum	Forks of Tranquille River	Red place (earth?).
Tsuk-tsuk-kwālk′	Reservation on North Thompson	Red place (trees).
Tsuk-ōx	One of the Red Lakes	Red lake.
Tuk-a-mukēn′	At head of Criss Creek	Bare ground.
Tuk-too′-la-hum	Tuk-too′-la-hum Lake	Saline.
Wā-lia	Napier Lake	
Za-kwas′-kī	Za-kwas′-kī Mountain	Dead.
Zlā′-lŏt	Black Hill Creek	Round prairie.

(2.) Shuswap Names of Places Beyond the Limits of the Kamloops Sheet.

Indian Name.	*Name adopted, or description of place on the map.*	*Meaning given for Indian name.*
Kup-pē-ē-kin	South part of Lytton Mountains	Sandy on one side.
Kwa-īk	Stream from west 9 miles below Lytton	
Poo′-ytl	Mountain 6 miles south-west of Lytton	The little.
Nī′-kwin-ī-o-ti-a-tin	Biche River, Okanagan Lake	Where they were caught.
Muh-klī′-num	Bouleau River, " "	Birch.
Na-as lā-kwe′-tok	Cedar Creek, " "	
Tin-tl-hoh-tan′	Stream north of Cedar Creek, Okanagan Lake	Where they were killed.
Ni-hot′	Second stream north of Cedar Creek, " "	Deep.
Kwin-ālhp	Mountain between Prospect Creek and Nicola River	Poison weed.
Slāh-kēn′	Mountain 3 miles south of Za-kwas′-ki	
Spī′-oos	Spioos River, tributary of Nicola	Twisted (in torsion).
Swas-a-'kh′	Stoyoma Mountain, '87 map	
Tsil-lat′-kō	Coldwater River	Cold water.
Tsha-us′-tum	Otter River, tributary of Tulameen	Otter river.
Tsul′-a-men	Tulameen River	Red paint.
Sa-kult′-kum	Little Shuswap Lake	
Pis-im-ah′	Mountain east side Adams Lake, 18 miles up	Medicine?
Too-wēs′-kun	Mtn. E. side N. Thompson, 11 m. above Reservation	Highest mountain.
Puh-hai-as′-hyum	Highest mountain north of Great Shuswap Lake	Rusty rock.
Sku'k-kak′-pa	High ridge west of Great Shuswap Lake	Sandy.
Kwī-koit′	Scotch Creek, Shuswap Lake	Something lying in the water.
Skwil-kwa-kwult	Tod Mountain, north-east from Kamloops	Bare or bald?
Hoom-a-tāt′-kwa	Copper Island, Great Shuswap Lake	In the middle of lake.
Spal-lum-shīn′	Spallumsheen River (mouth of)	Meadow flat.
Sinī-mou′-sun	Cinemousun, Great Shuswap Lake	Going round a point or bend.
Si-a-mous′	Schickmouse Narrows, Great Shuswap Lake	In the middle.
Stē′-ukw	Meadow on Louis Creek, foot of Tod Mountain	
Hum-hā′-mīlh	Lake at head of Barrière River	
Sīn′-max	Valley between Louis Creek and Adams Lake	Going round a point.
Sas′-kum	West branch of Barrière River	Open mouth.
Skwa-am	West side Adams Lake, 10 miles up	
Sam-a-to-sum	West side Adams Lake, 15 miles up	
Pit-loi-oo′-ya	West side Adams Lake, 26 miles up	Root place.
Mo′-meuh	Stream on east side Adams Lake, 32 miles up	
Too-mool-hax	East side Adams Lake, 11 miles up	
Tshīn′-a-kin	Mountain east side Adams Lake, 14 miles up	The shoulder blade.
Skwō′-kil-ow′	East side Adams Lake, 5 miles up	Paint.
In-tsūk-tām′	Watson Creek, Fraser River	Red (ravine)?
Tāl′-tsin-hin	Green Lake, Green Timber Plateau	
Skwī-tē′-ha	Mountain 6 miles south of Kl-ow′-a Mountain	Louse.
Kwo-klīn	Mountain south side Salmon River	
In-tē′-a-kom	Lake on south branch Kwoiek Creek	
Le-mip′	Lake on second south branch Kwoiek Creek	
Ne-we-kout	Lake at head of Kwoiek Creek	Round.
Skwil-ke-loos	Lake on Kwoiek Creek 3 miles long	
Kum-out′	Mountain at head of Kwoiek Creek	
Shi-how-ya	Head North-east Arm, Great Shuswap Lake	Sudden melting of snow.
She-whun-i-mēn	Head of Seymour Arm, " " "	They go away.
Kwieshp	Queest Creek, " " "	Buffalo.
Too-woot	Eagle Creek, " " "	
Skout-nun-hoo-looh	Head of Spallumsheen Arm, " "	
Shi-whots-i-mātl	Head of Salmon Arm, " "	Many *Shepherdia* berries.
Hoop-a-tāt-kwa	White Lake	
Shtle-al-um	Head of Adams Lake	Many bark canoes.
In-kō-māt′-koo	Mountain 3 miles south-west of Za-kwas′-kī	
Pin-e-ras′-kut	Lake south-west of Chaperon Lake	

(2.) SHUSWAP NAMES OF PLACES BEYOND THE LIMITS OF THE KAMLOOPS SHEET.—*Continued.*

Indian name.	*Name adopted, or description of place on the map.*	*Meaning given for Indian name.*
Hī-hium′	Lake south-west of Chaperon Lake	Big trout lake.
Pil-max	Stream which flows into head of Chaperon Lake	
Puh-hai-is-hun′	Mountain west side Okanagan Lake	
Puk-hēt′-kun	Mountain west side Okanagan Lake	Full of ravines.
Kee-lē-kwil-tin	Mountain west side Okanagan Lake	Big-horn mountain.
Spil-kuk-a-nilh′	Deep Creek west side Okanagan Lake	Eagle nest creek.
In-tshai′-pa-tin	Stream 4½ miles north of Deep Creek	

(3.) SHUSWAP NAMES OF INHABITED VILLAGES.

(*a*) *Principal Villages on the Kamloops sheet.*

Indian Name.	*Name adopted, or description of place on the map.*	*Meaning given for Indian name.*
Kam-a-loo′-la-pa	Kamloops	Point between the rivers.
Stlahl	Cornwalls	
Ne-whuh-wait′-tin-e-kin	4 miles above Câche Creek	
Pukaist′	1½ mile above Pukaist Creek	White.
N′-kam-sheen	Spence's Bridge	
Tl-kam-sheen	Lytton	
Ni-kai′-a	Opposite Lytton	
Stā-ai′-in	Stein Creek	
Nes-ī kip	Opposite Foster Bar	
Kan-lax′	Bridge River	The point.
Huh-ilp′	Fountain	On the edge.
Skwai′-luh	Pavilion Creek	Hoar-frost.
Kwē-kwē-a-kwēt′	11 miles above Kelley Creek	Blue.
Pil-tē′-uk	Clinton	White earth.
E-kuh-kah′-sha-tin	Pass valley near Deadman River	Drying place.
Ski-shis-tin	Deadman River	
Sh-ha-ha-nih	Skuh′-un Creek	
N′-kah-li-mil-uh	Mouth of Upper Nicola River	
Spa′-ha-min	Douglas Lake	Scraped.
Tsuk-tsuk-kwālk′	North Thompson	Red place.

(*b*) *A Few of the Principal Villages beyond the Limits of the Kamloops Sheet.*

Kwois-kun-a′	Near mouth of Spioos River	
Kwī-kooi′	Outlet of Adams Lake	
Kwout	Head of Little Shuswap Lake	
Sla-halt-kam	Foot of Little Shuswap Lake	Upper country.
Tshoo-loos′ *and* Na-ai-ik	Mouth of Guichon Creek	
Whatl-min-ēk′	6½ miles north of Deep Creek, Okanagan Lake	
Hal-aut	3 miles below Shuswap Lake	

II.—*Descriptive Notes on Certain Implements, Weapons, etc., from Graham Island, Queen Charlotte Islands, B.C.*

By Mr. ALEXANDER MACKENZIE,

With an introductory note by Dr. G. M. DAWSON.

(Read May 27, 1891.)

Some years ago a small collection of implements, weapons, etc., from the Queen Charlotte Islands was obtained for the museum of the Geological Survey from Mr. Mackenzie. Most of the objects in this collection are either specially fine examples of the arts of the Haida, or antiques, the value of which is enhanced by some knowledge of their history. The collection had been formed by Mr. Mackenzie under peculiarly advantageous circumstances during his residence at Masset, and was accompanied by a manuscript referring particularly to the various articles, but which includes besides some miscellaneous notes of interest respecting the Haida, their manners, customs and ideas. Mr. Mackenzie states that his notes are the result of original enquiries, and that he has purposely refrained from quoting information from sources already published. His knowledge of the Haida people, together with his habit of close observation, render his notes of special value.

It thus appears to be desirable not only to illustrate a few of the more interesting of the objects in this collection, but also to make this the occasion of publishing the notes referred to, in order that these may be rendered accessible to those interested in the ethnology of the West Coast. By permission of the Director of the Geological Survey, such of the objects as have been chosen for illustration have been drawn for this purpose by Mr. L. M. Lambe. In selecting these objects the writer has endeavoured to choose those which seem to be the most noteworthy, and particularly to exclude such as resemble those which have already appeared in his report on the Queen Charlotte Islands, contained in the Report of Progress of the Geological Survey for 1878-79. The first detailed account of the Haida people was given by the writer in the place just referred to, the material for it having been obtained in the course of a summer spent in exploring the Queen Charlotte Islands for the Geological Survey. Much additional information has, however, since appeared in various publications. Reference may be made particularly in this connection to an elaborate and copiously illustrated memoir by Mr. A. P. Niblack, entitled "The Coast Indians of Southern Alaska and Northern British Columbia," lately published in the annual report of the Smithsonian Institution.

It would appear that the pre-eminent position of the Haida among the various tribes of the West Coast has not yet been sufficiently recognized or appreciated by ethnologists. Twenty years ago little was known about them; the Queen Charlotte Islands were but rudely sketched on the charts, and the reports current as to the treacherous and warlike

character of their inhabitants, with the fact that the islands lay to the west of the main route of communication along the coast, caused them to be but seldom visited. This was even the case in 1878 when the writer undertook his exploration of the islands. Since that time the Tlingit peoples of the southern coast-strip of Alaska have been somewhat fully reported on by various writers, while considerable attention has also been devoted to the littoral of the southern part of British Columbia. As a result of these investigations, the arts and knowledge common to the coast peoples generally have been described and attached by description to various tribes in which both were less fully developed than they are among the Haida. When this difference came to be appreciated, a tendency arose to affirm that the Haida had borrowed and more fully developed the arts and customs of neighbouring tribes. In some cases this is true, but as a general statement it must be accepted with the utmost reserve Articles formed of copper and blankets woven of the hair of the mountain goat are known to have been obtained by the Haida from the Tlingit to the north; circumstances explained by the fact that the materials employed in both do not occur in the Queen Charlotte Islands. Some customs and dances are also known to have been adopted from the Tshimsian of the adjacent mainland, but further than this the proof does not go.

The fact remains that the arts of the Haida, with those of their neighbours the Tshimsian, had reached a stage of development, tending toward an incipient civilization, higher than that found in any other people of the west coast of North America. To the north, as well as to the south of the Queen Charlotte Islands, and to some extent in correspondence with the distance from these islands, are found ruder and more barbarous people, living in dwellings of inferior construction and surrounded by fewer and less artistically fashioned implements. The comparatively isolated position of the Haida and the relative immunity which this afforded against attack, may have been important in producing this result; while their occupation of a region upon all sides of which (save that of the ocean) different peoples with habits and traditions more or less varied bordered, may have rendered the Haida more Catholic in their beliefs. These, however, are but circumstances which may explain, while they do not detract from the premier position of this tribe; a position which was largely shared by the Tshimsian, though in consequence of the greater accessibility of the Tshimsian country, their primitive condition had suffered more change before it began to be intelligently studied.

Many collections which have been made are now to be found in museums credited vaguely to the Northwest Coast, a designation justified to a certain extent by the similarity of the character of the objects met with on this coast as a whole; but where the means are still available for analysing these miscellaneous collections and assigning them to the various tribes, it is found that a great proportion of the best fashioned and most artistically finished objects come from the Queen Charlotte Islands. The writer is pleased to note that Mr. Niblack, in the remarks made in his memoir above cited, appears fully to appreciate and admit the superior culture and dexterity of the Haida, of which people the Kaigani of the southern part of Alaska are but a modern colony. Speaking from his own somewhat extended opportunities of knowing the tribes of the Pacific Coast, and referring particularly to their mental capacity, the writer has no hesitation in recording his opinion that the Haida and Tshimsian are the most intelligent and capable.

In revising Mr. Mackenzie's notes for publication, his original orthography of nearly all the native names has been retained unchanged, but in a few places some remarks which appear to be unnecessary, because covered by what is already published, have been omitted.

GEORGE M. DAWSON.

Dance Staff (Haida *Tusk*).—A ceremonial staff of this kind was formerly used at feasts, dances and distributions of property. The principal man concerned in the ceremony, by forcibly tapping the floor with such a staff or baton, called the attention of the audience to the business immediately in hand. At feasts where property or blankets were given, or paid away, a significant tap of this staff intimated that the transaction was closed, resembling much the tap of an auctioneer's hammer on a bargain being concluded. The carved devices of crane, whale, crow, owl, and bear, with which it has been ornamented, refer to tribal legends.

The proprietorship of such a staff of course shewed that the owner was an *Eitlahgeet* or chief, who had made the necessary feasts and distributions of property to entitle him to that dignity. The staff was always carefully preserved in a safe place in the owner's lodge. [No. 1339.][1] Several somewhat similar staffs are figured by Mr. Niblack (plate xvii.)

Woven Hats (Haida *Haht-ul-sung-ah*).—These are made of spruce roots, and were both plain and painted, the shape being that common along the coast of British Columbia and frequently illustrated. One of these hats [No. 1335] is of more than ordinary dimensions [diameter 23 inches], and is of the kind worn only on the occasion of a distribution of property, the wearer then having on also a "dance blanket," and holding in the hand a staff, of the kind just noted. Such costume was suitable for either male or female. The devices painted on these hats seem to have been a matter of fancy, and to have had no particular significance. The dog-fish, whale, crow or bear were often represented on them. [Nos. 1333 to 1335.]

Large woven and pieced Dance-Blanket (Haida *Na-hung*)—This is a specimen of the dance-blanket or covering almost universally used at feasts, dances and ceremonials by the native tribes of the coast. Such blankets were made only by the Chilkats of the Alaskan coast, and although often called Haida blankets, the term is erroneous, as the Haida never practised the art of weaving wool or hair. These blankets were, however, highly valued by the Haida, and any one aspiring to the position of chief was expected to possess one such elaborate covering. Now they are rare, having been eagerly sought after by collectors. The devices are similar to those on Haida carvings, indeed the ornamentation of the latter seems by all evidence to have been copied from the tribes of Northern Alaska. The material used in making these blankets is mountain goat's wool and cedar bark. [No. 1374.]

Dance Head-dress (Haida *Tsilk*).—Ornamental head-dresses of this kind are used in ceremonial dances by the tribes of the Northwest Coast. An excellent illustration in

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[1] The numbers thus given throughout, are those under which the objects specially referred to are catalogued in the Museum of the Geological Survey. Some of them are figured in the accompanying plates.

colours of a head-dress of this kind is given among those published by the directors of the Ethnological Department, Berlin Museum, plate I. [No. 1317].

The upper part fits on the wearer's head like a cap. Above the forehead is a carving of some crest or device, beaver, bear, eagle, etc. No rule seems to be followed in selecting the device. In this instance the carving represents the beaver; it being merely a decoration according to the fancy of the carver. On either side of the carving there is a row of feathers of the great wood-pecker. Bound round the circlet of the cap at close intervals, are a number of bristles of sea-lion whiskers, while suspended from the back of the head-dress is a train of ermine skins. When the dancer was ready to go through his or her evolutions, a handful of eagle's down was placed on the top of the cap, being loosely held in position by the upstanding bristles. On every contortion of the body and jerk of the head the flexible sea-lion whiskers permitted a small quantity of the down to escape and float round the dancer's vicinity like snow-flakes. The effect of this was certain to ensure the applause of the spectators, according as the dancer's exertions were vigorous or otherwise.

On occasion of an arrival whom it was desirable to honour, the settlement of an individual quarrel, healing a tribal feud, making a treaty of friendship or peace, or celebrating a potlach or "house-warming," an indispensable adjunct to the ceremony was the dance with the *Tsilk* and *Na-hung* and scattering of eagle down. Sometimes a number of persons thus attired performed at once, and the costume was considered quite appropriate for either male or female dancers.

Sea-lion Whiskers (Haida *Kish-kow'-eh*). *Ermine Skin* (Haida *Klick*).—Wooden carved device on forehead (Haida *Tsil-kwull*).

Specimens of Wooden Masks (Haida *Neh-tsung*).—[Nos. 1305, 1306, 1309 to 1311 and 1313 to 1315]. These masks, grotesque and otherwise, were used at merrymakings pertaining to feasts, house inaugurations and dances. Faces of human or mythological beings, of birds or beasts, were represented by such masks, and no rule seems to have been followed in the matter of selection of subjects, that being according to the fancy or taste of the carver. Wooden or bone calls were generally used to imitate the cries of the animal represented by the mask.

Dance Head-dress Carving (Haida *Tsil-kwull*).—[No. 1312]. This represents a spirit-face seen by the doctors in their trance or reverie. The inlaid border of mother-of-pearl is made from the Abalone shell, brought in early days by trading vessels from California and the Sandwich Islands. Probably in still earlier times from the smaller native Haliotis.

Two models of carved Heraldic Columns (Haida *Keeang*).—One showing the circular aperture through its base which is used as the entrance to the house. [Nos. 1316, 1340.]

Such poles vary in height from 40 to 60 feet. The object in erecting these poles was to commemorate the event of a chief taking position in the tribe by building a house and making a distribution of all his property, principally blankets, which he had been accumulating and hoarding for years with this view. *Keeang* is the Haida name of such poles or columns in general application, but each pole has besides an individual and distinguishing name. Thus, for instance, one of the poles at Masset is named *Que-tilk-kep-tzoo*, which means "a watcher for arrivals," or "looking," or "watching for arrivals." It was erected by a Haida chief, named *Stultah*, on his decision to build a new lodge. The occasion, as usual, was marked by a large distribution of property, hundreds of

blankets and other valuables being given away to all who assisted at the making of the pole, or who were invited to the ceremony. Stultah was of the eagle crest, and according to custom, the recipients all belonged to other crests, no eagles receiving anything. Not long afterwards Stultah died, before his projected lodge was completed. His brother succeeded him, and assumed his name. He erected another carved pole in commemoration of Stultah's death and his own adoption of his brother's place. This was again accompanied by a feast or distribution of food to the multitude and of blankets to the makers of the pole.

A mortuary pole is called *Sath-lung-hāt*, and is altogether different from a pole erected on occasion of lodge-building. *Keeang*, or lodge poles, are hollowed out at the back, whilst *Sath-lung-hāt*, or mortuary poles, are solid, being generally a circular column with carving only on base and summit.

When it was decided to erect a *Keeang* and build a lodge, invitations were sent to the tribes in the vicinity to attend, and on arrival the people were received by dancers in costume and hospitably treated and feasted. When all the Indians from adjacent places were assembled, at the appointed time they proceeded to the place selected for the erection of the pole. A hole, seven, eight or ten feet deep having been dug, the pole was moved on rollers till the butt was in a proper position to slip into the hole. Then the process of elevation began. Long ropes were fastened to the pole and gangs of men, women and children took hold of the ends at a considerable distance away. The most able-bodied men advanced to the pole, standing so close all along on each side that they touched each other, and grasping the pole from underneath they raised it up by sheer strength, by a succession of lifts as high as their heads, while, in the meantime, others placed supports under it at each successive lift. Stout poles, tied together like shears, were then brought into play, while the lifters took sharp-pointed poles, about eight feet long, and standing in their former positions, lifted the pole (which was immediately supported by the men who shift the shears) by means of these sticks, until it attained an angle of about forty-five degrees. The butt was then gradually slipped into its place and the gangs at the ropes, who had been inactive all this time, got the signal to haul, when, amidst the most indescribable bellowing, holloaing and yelling, the pole was gradually and surely elevated to the perpendicular position. Great hurrahs, shouting and antics took place as the pole was set plumb and the earth filled into the hole.

The crowd next adjourned to the house of the owner, who feasted the people with Indian food, such as grease, berries, sea-weed, etc. This being completed, the man takes the place of *Eitlahgeet*, great chief, and the next thing he does is to distribute his property, a task requiring great discrimination. Very often on such occasions he adopts a new name, discarding that by which he was hitherto known. When he proclaims to the crowd that he is quite impoverished and has distributed all his effects, they appear to be delighted, and regard him as indeed a great chief.

This distribution of property was often the scene of riot and disorder, sometimes ending in bloodshed. Some of the recipients would consider that their share of the plunder was too small, and that they had been slighted, others who were less deserving having got a larger share. Invariably there was a show of discontent on the part of some of the guests, and if the donor could not reconcile them by fair words or an additional present, a forcible attack was often made on the pile of blankets and goods received by

those who were considered unduly favoured. The body of the lodge was then often the arena of serious disturbance, in which blankets and clothing were torn to shreds by an infuriated mob. Knives were sometimes freely used, and often the ominous report of a gun or pistol would be heard in the crowd, which would cause a panic and frantic rush to the doors and apertures of the house with what goods could be hastily snatched in hand, leaving a small knot of excited men and wailing women surrounding a bleeding corpse on the floor. Such an incident would, of course, lead to another feast and dance with payment of property to the relatives of the deceased. To the guests not implicated in the affair, a murder only meant more feasts and more fun, and to judge from appearances, these good old times were not disliked.

It is worthy of note, as already remarked, that the giver of a feast does not distribute presents to those of his own crest, whether such an one be a relative or not; for instance, an eagle making an occasion of raising a pole, would give nothing to the eagles, but the bears would be the recipients.

An invariable concomitant of these feasts after the arrival of the whites on the coast, was ardent spirits of a vile nature, supplied by rascally traders in sloops and schooners, or a fiery compound distilled by the natives themselves from molasses, sugar, rice, flour, or beans.

As far as the Haida of Masset are concerned, all the above is but a tale of the past, as they now neither erect columns, give potlaches, dance, nor distil liquor, having decided to follow the advice given them by the government and missionaries to live according to law and order.

Daggers (Haida *Kah-oolth*).—[Nos. 1300, 1301, 1304, 1330, 1331]. Such daggers are for the most part very ancient, and many of them have individual histories and traditions appertaining to them. They are formidable weapons in a hand to hand fight, and were always carried round the neck to feasts and similar social gatherings. No. 1331 is of tempered copper, the mode of its manufacture being said to have been possessed by the "ancients," who could hammer out native copper and give it a keen edge.

A legend is connected with No. 1304, in which it is said to have been carved and tempered by a woman who came from northern Alaska. Its history is known for two or three generations, it having passed from one chief to another, but its true origin is lost in obscurity. In former times assassination was by no means uncommon, and slaves were often commanded to perform the deed, generally with these formidable daggers. To the knowledge of several persons still alive, two cowardly murders were perpetrated by a slave at his master's instigation, with this particular weapon.

No. 1300 was procured from a man, now dead, who was for a long time under a tribal ban as a murderer, having deliberately stabbed a woman to death in a canoe in mid-sea, and thrown her body overboard, for the sake of getting her money. Years after, the deed was brought home to him, and he had to pay largely to save his life.

Stone Tomahawk (Haida *Hlth-at-low*).—[No. 1329.] This is a formidable weapon of offence, and was used by the tribes of the Northwest Coast in their forays and fights. Although small and light, one blow from a stout arm, fairly delivered, would pierce the strongest cranium.

Reindeer-antler Tomahawk (Haida *Scoots-hlth-at-low*).—[No. 1302.] This very ancient and interesting relic is made from one of the antlers of a species of reindeer which

inhabits the mountainous interior of Graham Island.[1] In olden times these reindeer were hunted by the Haida and killed with bow and arrow, being highly prized both for meat and skin.[2] This weapon was the property of the Masset doctor or medicine man, who is still alive but aged. To him it was bequeathed by his predecessor, who died many years ago. It was essentially a weapon of offence, a regular skull-cracker, similar to the last, and is said to have been used with fatal effect more than once. It is undoubtedly a relic of the times before these natives had intercourse with white men.

Bone Club (Haida *Sitz*). [No. 1303.]—This club is made from a rib bone of some species of whale and was used as a fish- or seal-killer like the next.

Carved Wooden Club (Haida *Sitz*). [No. 1277.]—This is one of the characteristic fish-killing clubs of the Haida used for knocking halibut, seals, etc., on the head after hooking or spearing them. No doubt it also proved a handy weapon in a personal tussle over the spoils of the chase. These carved clubs were invested with supernatural properties. Thus the Haida firmly believe, if overtaken by night at sea and reduced to sleep in their canoes, that by allowing such a club to float beside the canoe attached to a line, it has the property of scaring away whales and other monsters of the deep which might otherwise harm them.

Bone Dagger (Haida *Thl-saga-skwoots.*) [No. 1298.]—This was used by the medicine man in one of his imaginary conflicts with some malicious rival spirit doctor. At other times he used it as a skewer or hair-pin to keep up his long hair when rolled in a knot at the back of his head. On the handle is carved the representation of a land otter, an animal held by medicine men to possess supernatural attributes.

Twisted Copper Necklet (Haida *Hull-kuntz-tig-ah*). [No. 1332.]—This rare and valuable relic is the only one of the kind known in the Haida nation. It was prized more highly than any ornament or implement in their possession, and of a certainty was made before the natives were acquainted with white men. Tradition states it was made from native copper brought from Alaska. Capt. Dixon (1788) mentions having seen such a necklet worn by a chief at North Island, and it is believed by old Haida who have been questioned on the subject, that this identical necklet was the one that attracted his attention.[3]

As a work of art by untutored savages with rude tools it is remarkable. Though it has three strands it is all in one piece, twisted most systematically and tapering with precision from the centre to each end, all the strands being in perfect uniformity one with the other. Its history and former owners are known for two or three generations, but its origin is not known. It was worn by chiefs as a mark of their importance and descended in turn to each successor who was able to make a feast and distribution of property and take the place of the departed.

Carved Copper Armlet or Bracelet. [No. 1308.]—This is very old, and is the only copper armlet known in the Haida nation. It has been preserved in the same family for several generations and worn by the chief's wife. Its origin is unknown, but it certainly was made before the Haida saw white people. The mother-of-pearl inlaid work was renewed

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[1] See Trans, Royal Soc. Can., vol. viii, section iv, p. 52.

[2] See Marchand's Voyage, chap. v, 1791.

[3] Dixon writes :—" We frequently saw large circular wreaths of copper both at Norfolk Sound and Queen Charlotte Islands, which did not appear to be of foreign manufacture, but twisted into shape by the natives themselves, to wear as an ornament about the neck." " Voyage to the Northwest Coast of America, p. 237."

lately, the original pieces having been lost. Since they have had opportunity of obtaining silver from the whites, all bracelets, bangles and such like ornaments are made of that metal. Copper is now considered too base a metal for such use, although anciently it was esteemed of high value, next to iron.

Ancient "Coppers" (Haida *Taow*). [Nos. 1337, 1338.]—These are the only two antique coppers known among the people of Masset, and were made before the natives procured sheet copper from the Russians in Alaska. They have been in the possession of the same family through a long line of chiefs who displayed them on festal occasions. A chief named Edensaw, now long deceased [1], used to wear them bound one to each side of his head-dress (*tsilk*) on occasions of ceremonial dances, etc.

These coppers were formerly of great value among the coast tribes, ten slaves or one thousand blankets being sometimes bartered for one. They were regarded with peculiar veneration, and a chief who could afford to purchase one of these costly articles and cut it in pieces at a feast of property-distribution was highly honoured. The pieces were given away to the principal chiefs who were guests, and were most highly valued by them. Sometimes such a copper was nailed to the carved heraldic column or pole which was erected at the feast, and it then served as a permanent ostentatious mark of the owner's extravagance. Sometimes they were attached to mortuary receptacles in honour of the departed.

The size of these coppers varied from seven or eight inches to four feet long. The original coppers were brought from the northern portion of Alaska, and the tradition runs that they were first made out of lumps of native copper which were found in the bed of a river there, but latterly the Indians bought sheet copper from the Russians at Sitka, and also in Victoria, and several natives along the coast commenced manufacturing spurious coppers from this material, which ultimately produced a fall in the value of coppers, and by glutting the market destroyed the romance of the idea that the copper was one of earth's rarest and choicest treasures, fit only to be purchased by great chiefs who desired to squander away their property for the sake of gratifying their self esteem. The customs appertaining to such coppers were not peculiar to the Haida, but were practiced by all the tribes of the Northwest Coast.

These coppers were not polished, but blackened by a very peculiar process (long kept a secret by the makers) which produced a permanent dull black, on which heraldic devices were scratched or engraved. This blackening effectually prevented corrosion.

Each of the genuine old coppers had an individual name such as :—

Taow-ked-oos—"The copper that steals all the people."
Yen-an-taous—"The copper that is like a cloud."
Taow-kee-ass—"The copper that stands perpendicular."
Len-ah-taous—"The copper that must needs be fathomed." [2]

These names served to perpetuate the identity of the copper when it changed hands, and were used in referring to it in the traditions of the people.

The name of a copper in Haida is *Taow*, Sitka *Tinnah*, Tshimsean *Hy-y-etsk*.

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[1] Edensaw, is a name successively assumed by each chief of a certain district, by virtue of his office.

[2] Referring to its large size.

Examples of the prices paid for such coppers may be interesting. Thus *Taow-ked-oos* was sold by Edensaw to Legaic, a Tshimsean chief, for ten slaves. *Yen-an-taous* was sold by Edensaw to the same man for ten slaves, two large cedar canoes and one dance head-dress. *Taow-kee-ass* was purchased by a Tshimsean chief named *Nees-thlan-on-oos* from a Haida chief for eight slaves, one large cedar canoe, one hundred elk skins and eighty boxes of grease.[1]

The devices graven on the upper part of the copper were according to fancy, and represented the bear, eagle, crow, whale, etc. A conspicuous mark was always on these, the (T) cross, and on the skill with which this was executed depended in a great measure the value of the copper. This T or indentation is called in Haida *Taow-tsoo'-eh*, namely, "back-bone of the taow." It was hammered, when fashioned, on a pattern by a peculiar process known only to skilful workers, with the result that when the taow was finished the indentation of the T was of the same thickness as the rest of the copper plate. If this T proved thinner the value was considerably diminished, in fact the copper was considered not genuine.

Fantastic carving in red stone representing incidents and transformations related in traditions of the doings of Ni-kil-stlass, an evil mischievous spirit, sometimes described as a creator. [No. 1296.]—The inherent love of ornamentation and method of preserving tradition from oblivion by means of imagery in absence of written symbols is well shown by this carving.

As an illustration, one of the traditions regarding the doings of Ni-kil stlass may be here related.

Ni-kil-stlass, who at this time has assumed the form of *Yelth* (the raven) wished to become possessed of the moon, and so determined to steal it from a great spirit-chief who owned it and guarded it with jealous care. In order to gain access to this spirit-chief's lodge, the raven decided to change his form. He therefore transferred his spirit to a small piece of moss which hung above a clear spring of water. A young woman, a chief's daughter and wife of the son of the above spirit-chief, came to the spring to take a drink of water. She used a small basket or vessel made of woven roots. At that time the small piece of moss fell into the spring, and was lifted in this vessel to the lips of the woman, who blew it two or three times from her lips, but eventually swallowed it. In time she bore a son, a remarkably small child. This child incessantly cried for the moon to play with, thus—*koong-ah-ah, koong-ah-ah* ("The moon, the moon"). The spirit-chief in order to quiet the child, after carefully closing all apertures of the house, produced the moon and gave it to the child to play with. The child rolled it about for a time, but now kept crying *ah-ah-kineet, ah-ah-kineet.* ("open the smoke-hole"). He also put the moon in his mouth, but his mother observing this pulled it from him, but gave it to him again to roll about. The smoke-hole had been opened a little. He still kept crying *ah-ah-kineet*, till to quiet him the smoke-hole was opened a little more. Watching his opportunity he quickly put the moon in his mouth, assumed the form of a raven and flew out. He alighted on the summit of a high tree, where he hid the moon under his wing. A number of people then took stone axes and commenced to fell the tree. When the tree was nearly falling, the raven would fly to another tree. The people then began to fell the second tree, but again the raven would fly to another tree This was repeated several times, until the people wept over their failure to recover the moon. A great chief

[1] O'olachen fish grease; esteemed a delicacy.

then told the people to desist from their efforts, for the probability was that the raven was the great spirit himself who made them all.

With the moon concealed under his wing, the raven flew to the stream where many people were engaged in catching the oolachen (candle-fish), which were running into the river in great numbers at that time. It was dark, for there was no sun, moon or stars to give light.

The raven then asked the people for some oolachens, and promised to give them light if they would supply him. They answered him "You tell lies." Twice they said so. The raven then said, "You do not believe me, but you shall see if I lie." He then pulled the moon out a little way from under his wing, and all the people beholding light were very glad and hastened to give him plenty of oolachens. The raven was so pleased that he took the moon from under his wing, and said, "You shall have abundance of light." He then broke the moon in two. Taking one half he threw it up above him, calling out to the people, "The name of this is *Tsoo-way* (the sun) it will give you light in the day." He then took the other half and threw it up above him, and called out, "The name of this is *Koong* (the moon). Then taking up the fragments which had fallen when he broke the moon, he threw them up above him and called out, "The name of these is *Kah-ilt-ah* (stars). The moon and stars shall give you light at night."[1]

Three Jade Adzes (Haida *Qua-hootah*).—[Nos. 1291, 1276, 1293]. The most perfect of these was procured from a Haida medicine-man, to whom it was bequeathed by his predecessor.

Amongst the Haida such adzes were rare and costly, and only the principal chiefs were able to obtain one of them. They were prized for the keen cutting edge which could be given them and for their durability. The place from whence they were originally obtained is not known, but it is certain that the Haida and coast tribes of British Columbia procured some of them from the natives of Alaska.

With such adzes trees were felled for making large columns or lodge poles. It has often been a question in what manner large trees were felled with such a small and insignificant implement, but in fact the method was quite simple, and as the work was performed by slaves, the owner of the adze did not find it at all arduous. First a ring of two or three inches wide and deep was hewn with the adze round the butt of the tree, and then about three or four feet higher up another ring of the same dimensions was hewn out. Next the wood between these rings was split off by means of wedges, driven by heavy stone mauls or hammers. This proceeding was repeated until the heart of the tree was reached when it toppled over.

Pale-green Jade Tomahawk (Haida, *Hlth-at-low*).—[No. 1295.] This resembles No. 1329, but being of jade was much more highly esteemed and of greater value.

Slate Labret (Haida *Skoots-tet-kah*).—[No. 1274.] This, the only known specimen of a stone labret, was found about two feet below the surface of the ground at Masset. Its origin is unknown, but the Haida say that they never before heard of any of the ancients using labrets made of stone. Labrets were invariably made of bone, ivory, wood or shell. Prior to the finding of this labret, an aged Haida chief related that in olden time, when the status of a chieftainess mainly depended on the size of her labret, a

[1] Cf. Report of Progress, Geol. Surv. Can., 1878-79, p. 150 B. It will be observed that this version of the story differs somewhat from that obtained by me. G. M. D.

competition used to take place between wives of prominent chiefs as to which should have the longest protruding under lip and largest labret. The contest often resulted in injury to the lip by forcing into the orifice labrets of undue size. Sometimes the lip split from the orifice to the surface, making it then impossible to button in the labret. It seems, however, that rather than give up wearing the labret, they tied it to the lip by boring a hole in the labret and attaching it to the jagged edges of the wounded lip by threads. This stone labret shows evidence of having been used in this way, as one perfect hole and portion of the edge of another are distinctly seen. When the narrator of the above saw it, he agreed that it had evidently been fastened to the lip in the manner described. He added that he had never seen a pierced one before, or known personally of such a custom, but that any doubt he had entertained as to the truth of the legend was now removed by seeing this pierced labret.

The method of preparing the lip for the reception of these large labrets was as follows:—At a very early age, the under lip of the female child was pierced with a tiny hole,[1] and a small pin of bone or metal with a head on it was inserted in the orifice from the inside. As the child increased in years, these pins were gradually exchanged for ones of larger size, until on attaining womanhood, the pin was generally discarded and a small labret proper was inserted in the hole; this again being exchanged as years passed on for one of a larger size, until on middle age being attained, it became possible to insert labrets of huge size. This is a custom which has now fallen into disuse. It will be understood from what is above stated, that a young woman could never wear a very large labret.

Two Small Dolls or Images (Haida *Kwah-keet*).—[Nos. 1294 and 1289.] These are very old and their origin is unknown. Report says they were highly prized by the ancients, but they are not known to have been used otherwise than as children's toys. They are carved in white marble. One shews a labret, the other a peculiar incision in the lower lip.

Two Carved Mountain-goat Horns (Haida *Nee-sang* or *Nee-sang-ah*).—[Nos. 1286 and 1287.] These peculiar head ornaments were worn only by the sons of chiefs. A lock of hair above each temple was drawn tightly through the hollow of such horns and bound on the outside, which gave the horns an erect position. They were worn on festive occasions.

Two Carved Ivory Mortars (Haida *Qua-kull*).—The ivory of which these mortars are made is walrus tusk, and came from Northern Alaska. [Nos. 1284 and 1285.]

In olden times the Haida cultivated a plant which possessed a sedative-narcotic principle. This principle was contained in the leaves, which when of mature growth, were gathered and dried like tobacco leaves. When wanted for use some of the leaves were pounded in one of the large stone mortars (*tow*). Calcined clam shells were pulverized in the small ivory mortar. The pounded leaves were then mixed with a portion of the calcined clam shell, and the compound was chewed in the same manner in which the betel nut is employed in the east. This plant was called *Win-dah*, but at the present day no trace of it can be discovered. On the introduction of tobacco by white people the cultivation of windah was discontinued. The Haida made it an important article of barter with the neighbouring tribes.[2]

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[1] Generally in public, at a distribution-of-property feast.

[2] Cf. Report of Progress, Geol. Surv. Can., 1878-79, p. 114 B. Mr. R. Cunningham, of Port Essington, informs me that the Tshimsean used to obtain this narcotic weed in early days from the Haida, under the name of *win-dah* or *win-daw*, which is its Haida appelation. *Um-shi-wa'* is Tshimsean for "a foreigner," as for instance a white man,

Medicine-man's Ivory Charms (Haida *Kun-si-kah*).—[Nos. 1278, 1278A.] These were worn suspended round the neck by the Medicine man during the ceremony of operating on a patient. When the conjuring and rattling were concluded, the doctor very often detached one of these charms or amulets and suspended it round the sick person's neck. In other instances he sold or lent them as a protection to the wearer against evil influences.

Medicine-man's Rattle (Haida *Sissah*).—[No. 1328.] This rattle belonged to a medicine-man, and was in use for a long time. It was supposed that the sound of the rattle assisted the doctor to draw out the sickness from the patient's body, and when exercised for a considerable time with an uninterrupted monotonous sound, produced by a peculiar motion of the arm and wrist, it had a soothing effect on the sick person, and often caused him to fall into a kind of stupor resembling sleep.

Two Dance Rattles (Haida *Sissah*).—[Nos. 1280 and 1283.] These were used only as an accompaniment in keeping time to songs and dances, and were invariably made after the same pattern, with beak of a raven in front and body ornamented with frogs, etc.[1]

Carved Dish of Mountain Sheep's Horn (Haida *Skoots-kūā-thlah*).—[No. 1307.][2] The horn of which dishes and spoons of this sort were made was brought from the Upper Stikine river.

Bone Spear-heads (Haida *Skoots-kah*).—[Nos. 1297 and 1299.] These were made at a time when iron was a rarity, and were used for spearing seals and other sea animals.

Halibut Hook (Haida *Khain-tow*).—[No. 1281.] This kind of hook was universally used by the coast tribes in catching halibut before they procured iron hooks. It is made out of a knot of the spruce tree, cut out of the heart of the log and then steamed into the proper shape.[3]

Skyll Hook (Haida *Skyll-towl*).—[No. 1282.] This hook is also made out of a spruce knot steamed into form, and is used for catching the skill or black cod; a fish which inhabits very deep water, being sometimes hooked at the depth of 200 fathoms. When the hook is baited, it requires to be set by springing it open and keeping it in that position by means of a small wooden pin about three inches long. When the fish is hooked it pushes the pin out, and the strain on the hook being released it closes on the fish's jaw and thus effectually prevents its ridding itself of the barb and escaping.

Whistles and Calls, named in the Haida tongue variously *Sah-an* and *Hut-teet*.—[Nos. 1318 to 1327.] These were used in dances and merrymakings to imitate the voices of the birds and animals which were often depicted on the carved wooden masks worn on the same occasions.

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and the compound *Win-dum-shi-wa'* or "foreigner's tobacco" is now used to denote ordinary tobacco. It is interesting to note, further, that the place called Cumshiwa on the Queen Charlotte Islands was one of the chief localities of cultivation of the native narcotic plant. This name is, however, not the Haida name of the actual place, but that of its hereditary chief. The connection, if any, of the name with that of the tobacco has not been traced. Mr. R. H. Hall states that though the native narcotic weed is not now known, he has found reason to believe that it was a yellow-flowered poppy—*Papaver nudicaule?* G. M. D.

[1] Cf. Report of Progress, Geol. Surv. Can., 1878-79, plate xi, fig. 26.

[2] This resembles that figured in Report of Progress, Geol. Surv. Can., 1878-79, plate ix, fig. 18.

[3] Cf. Report of Progress, Geol. Surv. Can., 1878-79, plate vii, fig. 10.

Miscellaneous Notes.

The Sun.—The ancient Haida in a manner worshipped the sun. They considered it to be a great spirit, and in times of distress or peril its assistance was invoked. When small-pox visited the Queen Charlotte Islands for the first time, presents of blankets, clothes, dance-dresses, ornaments, etc., were hung outside the lodge to propitiate the sun, while the people cried, "Preserve us sun, do not kill us," etc. Other spirits besides the sun were propitiated or invoked by the Haida.

Origin of some of the Stars.—When the great flood took place which covered the face of the earth, a man had just stretched a sea-otter skin. As the waters rose he took refuge with his effects in his canoe.

The flood rose to the skies, the canoe was swamped and the man was drowned. The sea-otter stretcher had been on top of the canoe and floated. When the waters subsided the sea-otter stretcher remained in the skies, where now it is seen as the group of stars *Koh-eet-ow*, which white people call the Great Bear. *Koh*, a sea otter. *Koh-eet-ow*, a frame for stretching sea-otter skins.

The water-bailer and triangular foot-board of the canoe also remained on high after the waters subsided; the former is now seen as the Pleiades, and the latter as the Hyades. (*Hoot-oö* a water-bailer, Pleiades; *Tulth-uk-thley* or foot-board for a canoe, Hyades). The outline of the Pleiades resembles a water-bailer, and the outline of the Hyades that of the foot-board of a canoe.

The ancient Haida are said to have had names for all the constellations, but most of these are now forgotten.

Festivals—Lah-out festival of the dead. *Lag-un-ing* festival of the house-building.

Festivals for the dead were held as soon after the decease as sufficient food could be amassed and guests collected. Festivals were tribal, and all were guests except those of the same crest or totem as the deceased who were non-participants. The ancient Haida are said to have always endeavoured to hold their distribution-of-property feasts at the full of the moon, but the reason for this is not now known.

A Visit to Spirit-land.—A certain young man (name unknown) was mourning for his eldest brother and his sister's son, who had both been murdered shortly before, and he resolved to try and penetrate the mystery of the place where their spirits had gone to in the heavens.

He went to the top of a mountain with his bow and wood to make arrows. He sat down and made fifty arrows, which, one after another he shot up into space, where they disappeared. He then made fifty more, which he shot up with the same result. He then made a third lot of fifty, which he disposed of in the same manner. Then a fourth lot followed, and he noticed that the arrows were now fixed one in another by the point of each entering into the notch of the preceding one.

When he had finished shooting these last fifty arrows they reached nearly to the earth. So, to complete the connection, he stuck one end of his bow in the earth and leant the other against the string of arrows. Seizing the pillar of arrows he put his foot on the bow and commenced to climb aloft. To his surprise he now observed that each arrow was transfixed through a human head, which was strung as it were on this line of arrows, crown of head down and under jaw uppermost. This afforded him good foot-

hold, and each time as he put his foot on a jaw to raise himself up, the jaw closed sharply, making a noise as the upper and lower teeth met.

At length he reached the realms above, where he was hospitably entertained by the chief of the spirit-land. He saw his eldest brother and his sister's son, who told him not to mourn for them, for they were very happy and well off where they were.

When he was ready to descend to earth again, the chief of the spirit-land told him that if he now killed a man on earth the spirit of the deceased could easily find its way to the spirit-land, as he (the young man) had made a path with steps of human heads to reach it. The young man then safely descended to the earth.

Here the story suddenly ceases. Stories such as this were very popular amongst the Haida. They seem to have no moral to inculcate or point to illustrate, but are apparently related merely for pastime and are often most incongruous and contradictory.

Thunder (*Eelung*) is said to be caused by a large bird "Eelung" flapping its wings. This bird, of immense dimensions, lives on whales, which it catches in its talons made of copper. It flies away with a whale into space, and conceals itself in a dark cloud. Lightning is caused by the eyes of the bird opening and shutting. Eelung is said to have had two helpers, a man and a woman, spirit-people who assisted in whale catching.

The Greek cross (+ *Scalim*) was used to mark the skins of animals, such as bear, otter, etc., after they were stretched and dried, for the purpose of propitiating the spirit of the dead animal. Four crosses were used in a line down the middle of the back on the flesh side, and the color of the crosses was invariably red. The custom is still practised. This symbol was not used in any other way.

Certain clouds occasionally seen in the western horizon are termed *Qyow*. It is said qyow clouds indicate good weather. These clouds have the form of a T and the base-line of the T is supposed to represent the horizon. Spirit people are said to inhabit the region of the qyow. An old medicine-man saw the place in a vision. These spirit-people's heads were elongated on each side like the upper end of the T. They were called Qyow people.

There were no prescribed stages or degrees in the initiation of a medicine-man. (Haida *Sah-gah.*) The aspirant to that office was instructed by another medicine-man, generally his uncle, to whom he succeeded, and on his aptitude to learn the system did the length of his probation depend.

An old doctor says that there are a great many spirit doctors, who assist the medicine man by advice, and whom the medicine-men continually see in visions. There is, however, one spirit doctor pre-eminent above all the rest. He is known by two different names *Kon'-cull-at* and *Yee-kan-eek.*

I can find no meaning attached to these names. Haida doctors never used the drum by way of divination, nor did they employ passes or signs among themselves. Their great aim was to avoid meeting, as they professed to be afraid of each other, and the custom was for each doctor to magnify himself and traduce his rival. They professed to fight in visions. When the doctor exorcised a spirit of divination or conjuration, he uttered words and language which neither he himself nor others understood. This unknown speech was prompted by the spirit medicine-man who attended on him.

The Haida never believed in the transmigration of souls, that is to say, the soul of a

human being taking possession of a beast or bird, but they formerly believed, and to a great extent still believe, that the spirit of a human being deceased enters the flesh again in the person of a new-born babe, and it was the medicine-man's business to reveal whose soul it was and the name of the child. They also believed that every living thing, beasts, birds, fishes, reptiles and insects had spirits, which after death returned to their spirits abodes.

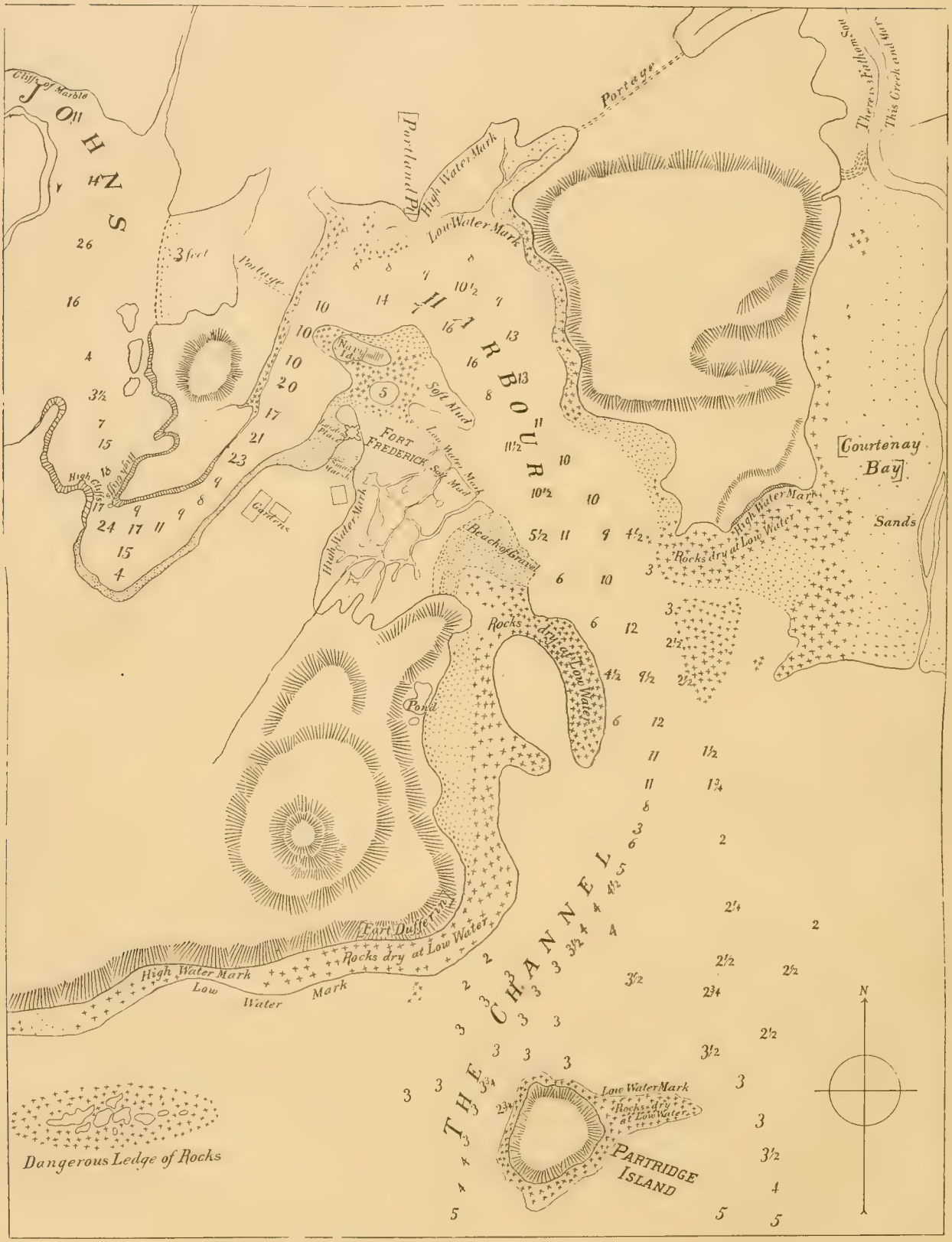
Great regard was paid by the ancient Haida to the number eight. For instance, eight products of the chase, as seals, otters, etc., was a cause of rejoicing. To catch eight halibut was a subject for congratulation. Eight times ten was favourably regarded, and eight hundred was the *ne plus ultra* or summit of good fortune. A chief who could give away eight hundred pieces of property in a feast was pre-eminent.

[In a late communication, Mr. Mackenzie states that he has found, on a small island named *Tee*, opposite the mouth of Lignite brook in Naden Harbour, a considerable portion of a stone arrow-head. The portion of an arrow-head in question is nearly two inches in length, but wants both tip and base. It is formed of streaked red jasper, narrowly tapering in form, but rather thick, one side being distinctly more convex than the other. It is rather neatly chipped, and a stone identical with it in character is found commonly in pebbles at the same place. [No. 2680.]

Mr. Mackenzie regards this as a very interesting discovery, as it is the only specimen of a chipped arrow-head or spear-head which he has ever known to have been found on the Queen Charlotte Islands. He further states, that with one exception, the Haida to whom he showed it were much surprised, and said that they had never seen or heard of such a thing before. The exception was an Indian who hunts a good deal on the west coast of the islands, where he stated that he had found such chipped stones at one place there.]

G. M. D.

No. 1.—ST. JOHN HARBOUR, Bruce, 1761, (with certain additions).



To illustrate Mr. W. F. Ganong's paper on Fort La Tour.

III.—*The Site of Fort La Tour.*

By W. F. GANONG, A.M.

(Communicated by Dr. George Stewart, F.R.G.S., May 27, 1891.)

Amidst the many brave deeds which enrich Canadian annals, a foremost place must ever be given to the noble defence by Madame de la Tour of her husband's fort by the River St. John. There is no event in the history of Acadia, not even excepting the expulsion, which so powerfully touches the deepest chords of our human sympathies as does this incident, with its picturesque setting of French feudalism romantically colouring the cold rocks and dark forests of the north, with its true womanly devotion opposed to heartless treachery, with its pathetically futile heroism.

Happily the story is well authenticated, for it rests upon the authority of two of the most truthful of all the chroniclers of Acadian events; indeed, it may be added, almost solely upon their authority.[1] The bearers of this honour are Nicolas Denys, governor under the French King of all the Gulf shore from Rosiers to Cape Breton, and John Winthrop, puritan governor of Massachusetts, both of them contemporary with the event, both too near its harsh realism to see in it the romance with which the softening haze of distance shows it to us, both too practical and too honest to pervert its facts for literary decoration or dramatic effect.

Denys' narrative cannot be too often repeated.[2] La Tour's fort, he tells us, was "destroyed by d'Aunay after he had wrongfully taken possession of it, as he had no right whatever to do, and which he would have found great difficulty in accomplishing had he not been advised of the absence of Sieur de la Tour, who had taken with him a part of his garrison, leaving only his wife and the remainder of his people to keep the fort. After having sustained for three days and three nights all the assaults of d'Aunay, and having obliged him to withdraw beyond reach of her cannon, she was finally obliged to surrender on the fourth day, which was Easter day, having been betrayed by a Swiss who was on guard whilst she, hoping for some respite, was making her followers rest. The Swiss, bribed by d'Aunay's men, allowed them to mount to the assault, which was resisted for some time by the lady commander at the head of her garrison. She only surrendered at the last extremity, and under condition that d'Aunay should spare all, which, indeed, he did not do, for after making himself master of the place, he threw them all into prison along with their lady commander. Then by advice of his council, he hung them, with the exception of a single one whose life was spared on the condition that he would do the hanging; and the lady commander had to be present at the scaffold with a rope around her neck as though she was the vilest criminal."

[1] Sir Thomas Temple's letters in the British State Paper office give an independent but brief and substantially similar account of the event.

[2] See appendix.

Winthrop is more concise, but as we would expect from a New Englander, he gives us exact figures:[1] "We understood for certain afterwards that Monsieur La Tour's fort was taken by assault and scalado, that Monsieur d'Aunay lost in the attempt twelve men and had many wounded, and that he had put to death all the men (both French and English) and had taken the lady, who died within three weeks after." The year of the event was 1645.

Such is the brave story. Should not Canadians ever wish to point to the spot where it was enacted? But where was Fort La Tour? At the present day no man can point with certainty to its site. It is in the effort to help towards the settlement of this important question that the present argument is submitted to this society.

There are three several localities which have been claimed as the site of the fort, and to these a fourth must now be added.

I. At the mouth of the Jemseg, 35 miles up the river from St. John.

II. On St. John Harbour, west side of the entrance, where Fort Dufferin now stands.

III. On St. John Harbour, west side, at Carleton Point, opposite Navy Island, where Fort Frederick afterwards stood; now known locally as "Old Fort."

IV On St. John Harbour, east side, and probably on the present Portland Point.

We shall very briefly examine the evidence for and against each locality.

I.—The Jemseg Site.

At least two writers whose views are entitled to consideration have placed Fort La Tour at Jemseg, where, as is well known, the French had a fort about 1670. The late Moses H. Perley, in a lecture delivered in St. John in 1841, of which the MS. is now in possession of his son, Mr. Henry F. Perley, of Ottawa, gives this locality, but no substantial reasons therefor. Apparently Mr. Perley had not access to either Denys' or Winthrop's works. M. E. Rameau de Saint-Père, in both editions of his "Une Colonie Féodale,"[2] likewise gives us this view and with no reasons, merely the bare statement that it was at Jemseg. It will take but few words to dismiss this supposition. The evidence for it we do not know; against it are the facts.

(1.) All known maps, marking the fort, place it at the mouth of the river.

(2.) Denys' full description, quoted below, places it at the mouth.

(3.) The mortgage of the fort, signed by La Tour himself, and given to Major Gibbons, of Boston, in security for large loans made to La Tour, is preserved in the Suffolk County Records in Boston and reads as follows:[3] "his fort called fort La Toure and plantačon wthin ye northerne part of america wherein ye s^{d} mouns^{r} together with his family hath of late made his Residence, scittuate & being at or neere the mouth of a certajne River called by ye name of [St.] Johns River."

[1] History of New England, II, p. 238.

[2] Paris, 1877, and Paris and Montreal, 1889.

[3] Suffolk County Deeds, Vol. I, fol. 9, 10; Hazard, State Papers, Vol. I, p. 541. Jack, History of St. John, p. 156.

Nothing could be more satisfactory on this point, and even other evidence is known.[1]

II.—The Fort Dufferin Site.

To this view, Mr. J. W. Lawrence, New Brunswick's venerable historian, and Mr. W. P. Dole, of St. John, have given their adherence. We cannot find that the former has expressed his opinion in print; but the latter has warmly championed the cause in a paper read before the N. B. Historical Society, and published in abstract in the St. John *Daily Sun* of December 5, 1888. The evidence in favour of the view is all expressed in the following summary:—

(1.) Tradition, derived from early settlers, in connection with the fact that fifty years ago traces of old earthworks were there to be seen, and that a well in the vicinity was called the Old French well.

(2.) Denys' description of the harbour, in which, according to Mr. Dole, it is stated that Charnisay's Fort, built after the destruction of Fort La Tour, was farther up the harbour than the latter. As Denys plainly locates Charnisay's Fort, where Fort Frederick afterwards was, Fort La Tour must therefore, according to Mr. Dole, be below, and Fort Dufferin is the natural situation for it.

No documentary, or cartographical or other evidence is offered in support of the view.

That it cannot express the truth appears to be shown by the following facts:—

(1.) Tradition in such a case as this is well-nigh worthless. Mr. Dole's tradition does not pretend to go back of the New England immigrants who came to the River in 1762 or 1763. The hundred and seventeen years which had elapsed since Fort La Tour fell had seen many changes about the harbour; forts had been erected and destroyed, and then the rocky shores had been abandoned by inhabitants for many years together. Prior to the coming of the New Englanders, all of the French had been expelled from the lower part of the river. Whence then did the former derive their tradition? Uninterrupted occupation by a single people gives traditions of value, though even then they may err; irregular and intermittent occupation by people of different races can afford no traditions of weight in comparison with documentary evidence. We know nothing of the origin of the earthworks or old well.

(2.) Denys does not say what Mr. Dole attributes to him, but something entirely different, as our readers may judge for themselves from the translation given below, and from the original reproduced in the appendix. That so accomplished a scholar as Mr.

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[1] As the letter of Gorges to Gov. Winthrop. (Williamson's "Maine," Vol. I, p. 312, and references here and there in Winthrop's "History of Massachusetts.") It is curious how this view originated. Haliburton does not distinctly state, though he implies it. Perhaps he had it from tradition, and he was followed without question by Gesner, Munro and others. Perley, however, and Rameau are independent investigators upon New Brunswick history and can hardly be supposed to have accepted it without some evidence.

There is yet another argument, quite unanswerable, which I had quite overlooked, and which I owe, with other valuable matter on New Brunswick history, to Mr. J. W. Lawrence, our New Brunswick historian. The first attack on the fort by Charnisay's ships took place in February, and the final attack between the 13th and 16th of April, at both of which seasons the river is frozen to its mouth, and it would have been utterly impossible to reach Jemseg.

Dole should have misread the plain French of Denys' narrative is most surprising. Denys does say that Charnisay's Fort stood on the site of Fort Frederick, as Mr. Dole states, but he says not one word that can be construed to mean that Fort La Tour stood below it or anywhere in the vicinity of Fort Dufferin.[1]

(3.) The total lack of other documentary and of cartographical evidence, in face of the mass of both, placing the fort farther up the harbour, cannot be overlooked. Early maps marking the forts on the harbour place neither of them at Fort Dufferin.

III.—The Fort Frederick Site.

This view was mentioned by Murdoch in 1864. To it the adherence of James Hannay, after long and careful study bearing on the question, gives the strongest support; and other local historians believe for the most part with him. Mr. Hannay has summed up the evidence in a paper presented to the N. B. Historical Society in Feb., 1882,[2] and published in a local paper at that time.

The evidence for his view is as follows, resting

(1) Upon a reading of Denys' narrative, which would make the "marshes" referred to by the latter the flats of Courtenay Bay; Charnisay's Fort, which was above them on the same side, would therefore come on the east side, and probably at Portland Point. As two forts are mentioned by Denys (a fact for which there is other ample evidence), and as Old Fort Point (site of Fort Frederick) is the only other place on the harbour where a fort is known to have stood, by a process of exclusion, Fort La Tour must have stood on Old Fort Point in Carleton.

(2.) Upon a statement of M. Massé de St. Maurice, in a letter to the French Government, written in 1760,[3] in which it is said: "Fort La Tour, or St. John, is on the left bank of the River St. John, and that it has a garrison of 180 Englishmen." As this garrison was certainly in Fort Frederick, the latter and Fort La Tour must therefore occupy the same site.[4]

(3.) Upon a chain of reasoning which endeavours to trace the history of both forts continuously from the time of La Tour and Charnisay to the building of Fort Frederick, and to show that the Portland Point Fort, Villebon's Fort, and Charnisay's Fort all occupied one site, while Fort Frederick, a fort mentioned by Cardillac and others, and Fort La Tour occupied the Carleton site.

No evidence from maps is offered by Mr. Hannay.

The reasons why Mr. Hannay's arguments are far from convincing are as follows:—

(1.) He has incorrectly read Denys' narrative; or rather, in the copy or translation

[1] Unless Denys' mention of "behind the island where vessels anchor" be taken to refer to Partridge Island. But not only is this not sustained by any facts whatever in the narrative, but it is expressly contradicted by Denys himself. A little further along, after describing the harbour and forts, he resumes his description of the river above them, saying: "The island of which I have spoken being passed, under which vessels anchor that they may be more sheltered, it is only a good cannon shot to the falls," etc. The words cannot possibly be made to apply to any other than Navy Island.

[2] The MS. of this he has been so generous as to loan to the present writer for use in the preparation of this paper.

[3] Given in Murdoch's "Nova Scotia," Vol. II, p. 383.

[4] Mr. Hannay does not mention this in his paper, but in a letter to the present writer.

which he has used, some words of primary importance which are fatal to his view have been omitted. This misreading of passages in Denys' work, which are in such plain French that it seems utterly impossible that anyone could ever misunderstand them, is the strangest fact in all of our local literature. As a matter of fact, as the reader can see for himself below, Denys, after speaking of what Mr. Hannay must admit to be Partridge Island, goes on to add: "On the same side as the island there are great marshes or flats." These words, "on the same side as the island," are totally omitted from Mr. Hannay's translation as given in his paper, and thus is destroyed the sense of a passage which in its truth and entirety is quite fatal to the theory he seeks to establish. But this matter will come up again in a moment.

(2.) A bare statement of this sort can have very little weight when not backed by reliable evidence of some sort. We have no reason for believing that M. Massé de St. Maurice, writing in 1760, had any reliable information as to the site of Fort La Tour. But, on the other hand, maps of 1755 (presently to be referred to) are known, which place Fort La Tour on the west side, and it was very probably from one of these that he had his information.

(3.) Mr. Hannay's whole reasoning is based, as he himself tells us, upon the supposition that Fort La Tour stood on the Fort Frederick site. Taking this for granted at the start, he proceeds to show that all we know of the subsequent history of both forts is consistent with his assumption, and hence a strong degree of probability is attached to the latter. But aside from the fact that Mr. Hannay by no means succeeds in proving all of his points in the line of the argument, owing to our very scanty knowledge of their subsequent history,[1] there is the additional difficulty that if the assumption to start with be just the reverse, i.e., that Fort La Tour was at Portland Point, everything is just as consistent with the assumption as in the former case.

The entire absence of cartographical evidence is a serious drawback to Mr. Hannay's argument. The only maps he mentions, two in number, he admits to be against his view. In a question of exact geography, the evidence of maps cannot be neglected.

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[1] For instance, to take but a single point, Mr. Hannay argues from passages in Church's history of his eastern expedition that Villebon's fort, built in 1696, was on the east side. But this is directly opposed by a statement of Brouillon, who was personally on the ground in 1701. His description of the fort (in "Collection des Manuscrits," Quebec, 1884, Vol. II, p. 390) calls the land "low, wet and unhealthy, which makes both garrison and stores suffer," which applies perfectly to the Old Fort Point site, but not to Portland Point. Then he says: "The water is very bad and very scarce"—almost the identical words of Denys, who applied them to Charnisay's Fort at Carleton (see below p. 67); and then he adds: "The place is very contracted, and all that M. Villebon has been able to do has been to arrange what little earth there is in bastions very little elevated and with a slope very easy to surmount." And again (Murdoch, I, p. 249), he calls it "extremely small, and commanded on one side by an island, at the distance of a pistol shot, and on the other by a height which commanded it entirely, at the distance of only a hundred and odd fathoms, with the disadvantge of having no water to drink without going to seek it beyond the torrent of the River St. John." Brouillon thus clearly indicates that Villebon's Fort was in Carleton, and not on the east side, as Mr. Hannay's chain of reasoning requires.

As this paper is passing through the press, I have received from Paris a copy of a map in the French Archives, entitled "Plan du Fort de la Rivière de St. Jean, par le Sr. de Villieu, 20 8br 1700." This is Villebon's fort, and shows it surrounded by water on the west, north and east sides, and connected with the land to the south by a marshy neck. This settles finally the situation of Villebon's fort, as Mr. Hannay, who has seen the map, admits. It was in Carleton at "Old Fort." Hence Mr. Hannay's chain of reasoning must fall to the ground.

Just to the south-west on this map is marked a hill, with the inscription, "hauteur d'où le fort peut estre incommodé." This is of course the height mentioned by Brouillon, and is the very abrupt hill, higher than "Old Fort," on Water street between Market and Ludlow, in Carleton.

IV.—The Portland Point Site.

So far as he knows, the present writer is the first who has been forced to the conclusion that Fort La Tour was on the east side of the harbour, probably at Portland Point.[1] This view is based upon the following facts :—

(1.) Denys' description of the harbour shows that Fort La Tour could not have been at Carleton. Denys' authority on matters of fact of this kind has never been questioned. All writers praise his honesty and accuracy.[2] He was an eye-witness of nearly all he describes. He knew intimately both La Tour and Charnisay, had visited St. John harbour, and after La Tour's ruin had employed some of La Tour's men, as he himself tells us. He must have known then where Fort La Tour was. His entire reference to the subject is as follows : "The entrance of the river Saint John is dangerous of access, the shore ranging close up from both directions; the best entrance is on the starboard or right hand side, not approaching too near the shore. This entrance is narrow, because of a little island which is to larboard or on the left side, which being passed the river is much larger. On the same side as the island there are large marshes or flats which are covered at high tide ; the beach is of muddy sand, which makes a point, which passed, there is a cove [or creek] which makes into the said marshes, of which the entrance is narrow, and there the late Sieur Monsieur de la Tour had caused to be made a weir [or dam, *écluse*] in which were caught a great number of those Gaspereaux which were salted for winter ; he several times caught there so great a quantity that it was necessary to break the weir and push them back into the sea, as otherwise they would have given the weir a stench which would have been ruined by it. There were found there sometimes also salmon, alewives and bass, which is the *maigre* of La Rochelle, which serve all the spring as a grand manna for the inhabitants of this country.

"A little further on, beyond the said weir, there is a little mound where d'Aunay built his fort, which I have not found well placed according to my idea, for it is commanded by an island which is very near and higher ground, and behind which all ships can place themselves under cover from the fort, in which there is only water from pits, which is not very good, no better than that outside the fort. It would have been in my opinion better placed behind the island where vessels anchor, and where it would have been higher, and, in consequence, not commanded by other neighbouring places, and would have had good water, as in that which was built by the said late Sieur de la Tour, which was destroyed by d'Aunay after he had wrongfully taken possession of it,"—and so on as has already been quoted at the beginning of this paper.

We do not believe that any modern writer could condense into so few words a description of the harbour which would be more easily recognizable. Upon the larger

[1] It is true two other writers, Williamson, in his "History of Maine," Vol. I, p. 308, and Smith, in "America," Vol. IV, p. 143, have said that the fort stood on the east side, where the city now is, but neither give any authority for the statement. Probably the latter copied it from the former, who in turn took it from some of the old maps to which we refer below.

[2] See "America," IV, p. 153, which says: "He was a careful and observant navigator, but in its historical part it is confused and perplexing." This criticism does not refer to his relations of matters of fact with which he was contemporary, but to his discussion of older history. Note that Charlevoix says of him : "He tells nothing but what he saw himself."

map accompanying this paper, a copy of a portion of Bruce's chart of 1761, which, made from surveys, is quite accurate and shows the harbour unmodified by modern changes, Denys' description can be readily followed; as, indeed, it can be without a map by those familiar with St. John Harbour.

Is it possible to doubt that the island on the left of the entrance mentioned by Denys is Partridge Island, or that the marshes and flats on the same side as the island are the Carleton flats, extending all along the west side of the harbour and merging into the great marshy mud flats now for the most part filled in except for the Mill Pond? How can the flats so described by Denys possibly be the Courtenay Bay flats as required by Mr. Hannay's theory? The beach, which is composed of muddy or miry sand, and which extends out into a point, is mentioned next. Can it be doubted that this point is that which is now Sand Point? A modern chart shows even better than the Bruce map the extent and form of these flats, and how well Denys' description applies thereto. This point being passed, he tells us there is a cove (or creek) making into the said marshes, across the narrow entrance of which La Tour built his weir. Can any description be clearer than this? What are the "said marshes," if not the Carleton flats already referred to, now filled in except for the Mill Pond? And the creek is shown with the most satisfying clearness in Bruce's map just above the beach of gravel. Where are the places on the east side of the harbour to which these words would apply?

And now comes the crucial point: "A little further on, beyond the said weir, there is a little mound where d'Aunay built his fort," says Denys. There is such a mound precisely where Denys says; and upon it long afterwards Fort Frederick stood; there is no other with which it can be confounded. Here then was the site of Charnisay's Fort. How can this description be possibly so forced as to place it at Portland Point, as Mr. Hannay would have us believe? But this is not all; Denys tells us more: "I have not found [it] well placed according to my idea, for it is commanded by an island which is very near and higher ground, and behind which all ships can place themselves under cover from the fort, in which is only water from pits [or wells], which is not very good; no better than that outside the fort." There is but a single island in the harbour above Partridge Island, and that is very near the mound. It is to-day of about the same height as the site of Fort Frederick, but even now at low tide vessels could lie behind it out of reach of the guns of a fort on the shore. There is good reason to suppose that the island was higher nearly two hundred and fifty years ago.[1] As there is but a single island in the harbour, this one apparent inconsistency as to its height cannot throw us off the track.

[1] The island is washing away very rapidly indeed, the estimate of a resident being that 150 feet of the lower end have disappeared within thirty years. Its highest point is at present twenty feet above high tide, about the height of the "Old Fort" site. It was probably formerly wooded, and large stumps can still be seen *in situ* upon its northern beach. It is known to be steadily sinking, but the movement probably affects the mainland as well. It consists of gravel overlying slate, and even its highest part may have been lowered much in two hundred and forty years. It is quite possible, too, that the old fort site is higher than when Charnisay built his fort upon it, as the successive rebuildings upon the site would tend to raise it somewhat. An old resident on the island told me that very large numbers of cannon balls had been exposed in the washing away of a clay bank at the northern end, balls which seemed to have been shot from the opposite, *i. e.* the Portland, shore. It seems certain that these must have been fired from the fort on Portland Point. Is it not probable that they came from Fort La Tour against the ships of d'Aulnay during its vigorous defences? And do they not increase the probability that it was La Tour's fort which stood there, and not Charnisay's, which was temporary and probably never besieged, as he had no enemies after it was built?

Then the point as to the bad water; as the Bruce map shows, and as old people in Carleton (according to Mr. Hannay) still remember, the low mound of which we speak was cut off from the main shore by a little marsh, through which ran a small creek, which was filled at high tide, making an island of the mound. Under such conditions good water within the fort was an impossibility, and it could be little better than that which flowed outside. This is less probably the case with Portland Point, which is on high ground backed by rocky hills, conditions which should give good water from wells.

So much for the site of Charnisay's fort. But where was La Tour's? In the next passage we are told: "It would have been in my opinion better placed behind the island where vessels anchor, and where it would have been higher, and in consequence not commanded by other neighbouring places, and would have had good water as in that which was built by the said late Sieur de la Tour." La Tour's fort, then, stood behind the island where vessels anchor. Is there any ambiguity here? Can it possibly mean anything other than that it stood on the other side of the island (behind it) from Charnisay's, on the shore opposite which vessels anchor? This describes Portland Point to perfection; it describes no other site on the harbour. Vessels cannot lie behind any island out of reach of its guns. It stood on higher ground, Denys said, and not commanded by neighbouring places.[1] Portland Point is much higher than Navy Island and not commanded by it, though it is commanded by Fort Howe Hill. But the conditions of to-day are very different from those of two hundred and more years ago. Then, as we know from records left by the early settlers, the whole present site of the city, and presumably that of the late city of Portland, was covered by a dense growth of trees. Probably through these the small forces of any enemy likely to attack the fort would find it so difficult to drag cannon and mount them that the heights of Fort Howe were considered to be practically useless. There is certainly no hill or height readily accessible from the water which commands the Portland Point site. The case was different with Navy Island, upon which cannon could be landed under shelter and turned against a fort on the Carleton shore. We must admit this discrepancy in Denys' narrative; but in the light of the probability we have mentioned it appears to us to count for very little against the very accurate location implied by his preceding words. It is the only real discrepancy in his narrative. Moreover, there is no other locality about the harbour to which the same objection is not in great measure applicable, and certainly no other to which the full description so well applies.

That there was an old French fort at Portland Point is well known. It stood on what is to-day a grassy knoll, abrupt and commanding, at the south end and east side of Portland street, at the head of Rankine's wharf. Its ruins were found by the New England settlers when they reached the harbour in 1762, and upon its site, one of them, James Simonds, built his house, choosing it because it was already cleared.[2] No other site of an ancient fort is known about the harbour, except the two we have mentioned,

[1] The strategic value of both the Fort Dufferin and the Fort Frederick sites has been pointed out by Mr. Dole and Mr. Hannay. In this respect Portland Point is a most formidable rival to both the former places, and considering the short range of the cannon of the time rather better than either of them.

[2] Mr. M. H. Perley, in his lecture on the "Early History of New Brunswick," printed in *Educational Review*, Vol. IV, No. 9, says: "They [Peabody, Simonds and White] arrived on the 19th of May, 1762 and landed at Portland Point, where there was a small clearing and the traces of an old French fort." Mr. Perley also mentions that skeletons have been found there. Might they be those of the defenders of La Tour's fort, whom Charnisay so

and had there been such, it could hardly have escaped notice and mention by the early settlers. In the face of all this, does there seem room for any doubt that Fort La Tour was the fort that stood on Portland Point?

(2.) There are several maps of the seventeenth and early part of the eighteenth centuries which mark Fort La Tour on the east side of the harbour; the earliest I have been able to find which places it on the west side bears date of 1755, and even in the best instance of the latter a second and corrected edition restores it to the east side. So marked is this feature that the statement is not too positive that *all known maps made within a hundred years after its destruction, most of them made by map-makers who had good direct evidence as to its location, if they mark Fort La Tour at all, place it upon the east side of the harbour.*

It is true that evidence of this kind must be used with caution, for map-makers often copied directly one from another, and if the first were wrong a long following series might be also misled. This important source of error can be eliminated, however, if it can be proven that a number of maps showing a certain feature were made independently of one another, and especially if it can be shown that some of them were made from actual surveys. In the following notes on the early maps bearing on our subject we have selected only those which appear to be of this nature, neglecting all of those which were obviously copied one from another.[1]

MAP No. 1.—The first map we offer in evidence is entitled :—

Le Canada, faict par le Sr. de Champlain où sont La Nouvelle France, La Nouvelle Angleterre [*etc.*], *suivant les memoires de P. Du Val, Géographe du Roy, Paris*, 1677. It is not necessary to offer a tracing of this map. On the east side of the river at its mouth there is shown a square fort with no name, but the number 14 attached. In the copy I have examined, through the kind courtesy of Professor E. N. Horsford, of Cambridge, the key explaining the numbers is missing, but the map has so much in common with later ones which mark this fort, Fort La Tour, that we can hardly doubt that such is the name attached to this figure in the key.[2] In any event, it is important to notice that the *only*

cruelly killed? Mr. J. W. Lawrence (*Footprints*, p. 4) says: "Mr. Simonds erected his dwelling on the ruins of an old French fort, Portland Point." And the map in the same work shows the position of the house.

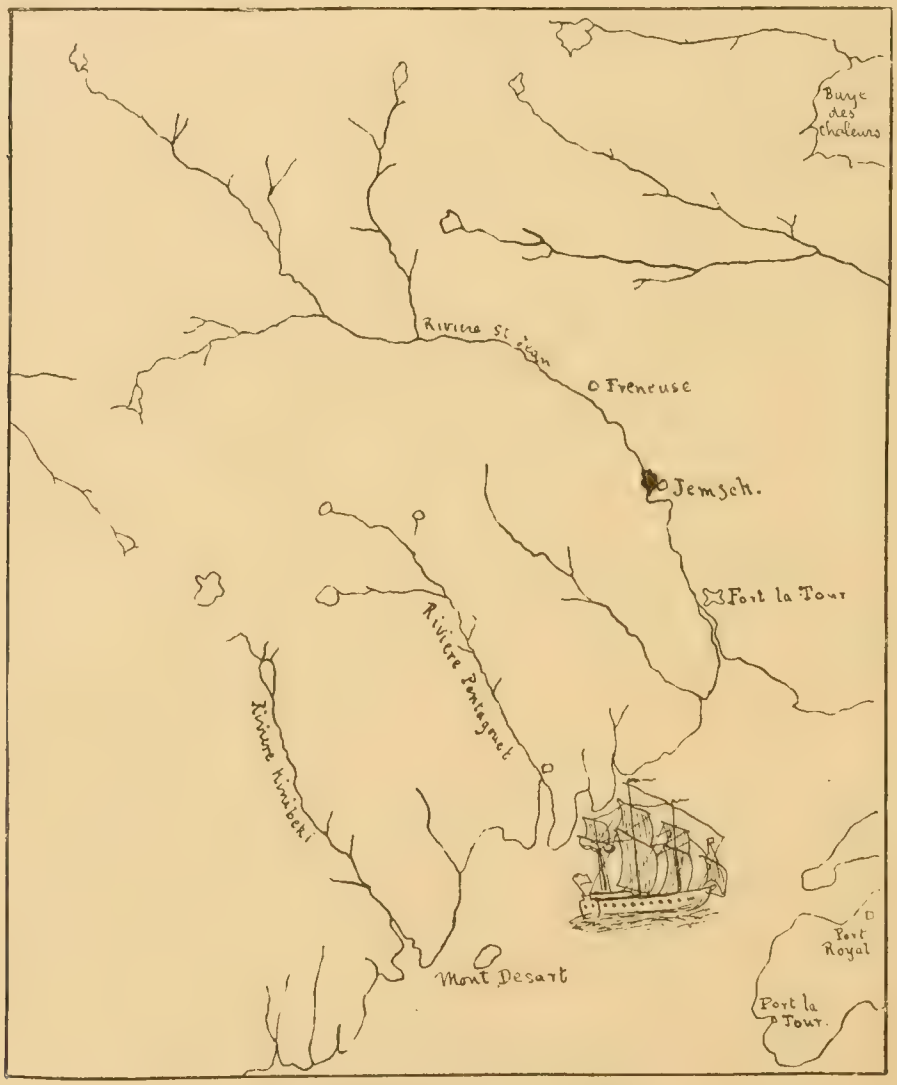
It is a very interesting fact that the site of the fort is to-day unencumbered by buildings. Its situation is most commanding, affording a most beautiful view of the harbor, Carleton and the river, and as one stands upon it he cannot help thinking how superior it is for the site of a fort to the "Old Fort" site in Carleton. There is deep water immediately in front of it, where in old times vessels used to be unloaded. It has, moreover, a most excellent landing place at all tides, while the "Old Fort" site has not. But little is known locally about the place. Mr. John McAllister of St. John has told me that cannon balls have been found on the site, and he writes me that, ten years ago, as a drain was being dug around the base of the hill, "the workmen, when about five feet from the surface, drew my attention to a pavement of stone very neatly and firmly made, about five feet below the surface, evidently showing that some careful work had long ago been done there." This point is interesting. Careful paving was likely to have been done in connection with La Tour's powerful fort, not with Charnisay's temporary and weaker one. A workman told me that excavations showed that the hill is partly artificial, as clay had been brought there to build it up. It is well known that the original Simonds house stood upon it.

[1] There is mentioned in Marcel's "Cartographie de la Nouvelle France" a map of 1607, on which there had been subsequently marked the site of the settlements, including La Tour's in Acadia. In applying to M. Marcel in Paris I find that the map has now passed out of his possession; it might be of very great value in this connection. Although I have made every effort, with M. Marcel's assistance, to trace it, I have so far not been successful.

[2] This map is reproduced in Prof. Horsford's superbly illustrated "Defences of Norumbega," fifth map facing page 70. I have found, since the above was printed, that the No. 14 does not apply to the fort but to the river. This does not, however, weaken the force of the argument—the only fort marked is on the east side of the river.

fort at the mouth of the River St. John is on the east side. This map was made in Paris, where its author presumably had access to the most reliable materials. This was in 1677—long before Villebon or any other French general had rebuilt either of the forts at St. John. There are earlier editions of this map in the French Archives—of 1664, and even earlier, but we do not know whether they show the fort.[1]

Map No. 2.—Our second map is most important. It is a portion of a manuscript sketch contained in Vol. II, p. 11, of the "Documents collected in France," now preserved



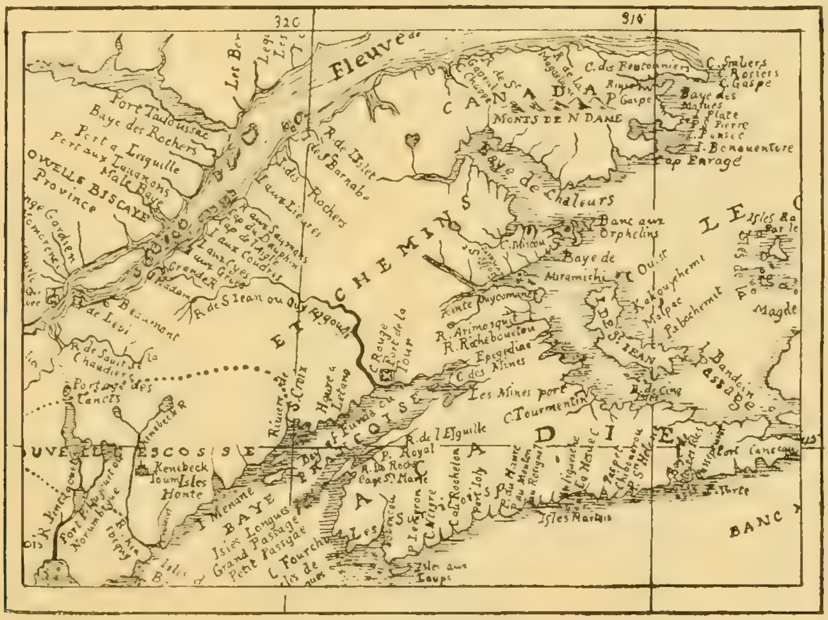
No. 2.—Massachusetts Archives, 1680.

in the Massachusetts Archives in the State House at Boston. It is really a map of New England, but shows a portion of Acadia. It bears date of 1680 and shows every evidence

[1] As this paper passess through the press, I have received from M. Henry Vignaud of Paris (to whom I owe much other material of historical value) a letter in which he tells me that the two earlier editions of this map—of 1653 and 1664—both have it on the *west* side. The only answer I can give to this unexpected fact is that the maker of the 1677 edition saw good cause to change the fort from the west to the east side; but what that evidence was we can only conjecture.

of having been made independently of No. 1. Its author is unknown, but he must have had an actual knowledge of the St. John River, for both Freneuse and Jemseg, the only other places marked on the river, are in their proper positions ; just where we know from other evidence they really were. We can hardly conceive that only thirty-five years after its fall, and when its position could not have been confounded with that of any later built fort (Villebon's after 1696 being the earliest of which we have any record), that a map-maker, whose knowledge of the river enabled him to correctly place the only other places marked on it, could have erred as to the site of Fort La Tour.

MAP No. 3.—The map of 1689, made by Coronelli and Tillemon, published in Paris, is the most complete and accurate of its time. Its author appears to have had information not accessible to DuVal, as witness a number of very different names upon the north shore of New Brunswick, and does not appear to have used map No. 2 above, since he omits Freneuse and Jemseg. It is well known that the old map-makers were too anxious



No. 3.—Coronelli, 1689.

to fill with names the blank spaces on their maps, to leave out any which they could get backed by good authority. That it locates Fort La Tour on the east side must have great weight in this discussion. It is to be noticed that it antedates the building of Villebon's fort—the first one built on the harbour after the destruction of Fort La Tour.

MAP No. 4.—In the "Fourth Part of the General English Pilot describing . . . America," London, 1707, there is a map entitled :

A Chart of New France, Newfoundland, New Scotland and part of New England. By Jer. Seller and Cha. Price, of which a sketch is herewith given. There is every reason to believe that this crude map was in large part made by Cyprian Southack, an English captain who coasted much on the shores of Acadia and who made several maps of this region. His name appears frequently upon this map, and its whole appearance corresponds closely

to that of other maps which bear his name as maker. I may add that the remarks made in the present paper as to the authorship and authenticity of various maps are the result of careful studies, made entirely apart from the present discussion, in connection with a

No. 4.—Southack (?), 1707, (1695?).

study of the Cartography of Acadia, which I hope in time to be allowed the honour of placing before this society.

The map is very crude, and both names and topography are given with but little reference to previous maps, but it is one undoubtedly made from real surveys. It certainly belongs much before 1707, the date of the atlas which contains it. Since Southack

was with Church on his expeditions east, and as Fort Nashwaak is not shown, this probably represents the region before the siege of the latter by the English in 1696, and before Villebon's fort was built at the mouth of the river. The rough sketch of St. John Harbour is what chiefly interests us at present, and there we can easily recognize Partridge Island, the Falls, the wooden fort, well known to have stood at the mouth of the Nerepis, and the village at Indiantown, here dignified by the name of St. Johns Towne. Then we see two forts, of which that on the east side is the larger. This is a point of much importance, since it shows the larger of the ruins of the forts to have been on the east side. As La Tour's was without doubt a larger fort than Charnisay's,[1] and as Villebon's fort is shown by his own letters to have been simply the old fort in Carleton repaired, this map helps to increase the probability that Fort La Tour stood on the east side.

MAP No 5.—Another map of high authority, and great accuracy for its time, is *Carte du Canada, ou de la Nouvelle France. Par Guillaume de l'Isle, Paris*, 1703. It also places Fort La Tour on the east side, as do Moll's maps of 1715-1720. A number of other maps could be mentioned which do likewise, but, as they obviously follow one or the other of these we have mentioned, their testimony is of slight value.

TRANSITION MAPS.—We now come to a series of maps upon which the name Fort La Tour does not appear at all, though forts are marked either upon one or both sides of the harbour, and called either simply "fort," or else "French fort," or even Fort St. Jean. Such are those of Popple of 1733, Bellin of 1744, Mitchell and Jeffery's of 1755 and many others. This is the period in which the real site of the fort has become confused by the fact of others having been built upon its site, and also upon the site of Charnisay's, and the best map-makers had dropped the name La Tour altogether. But in 1755 there appeared two maps, made by two of the greatest of French cartographers, Bellin and

No. 5.—Bellin, 1755.

No. 6.—D'Anville, 1755.

d'Anville. Both of these men are renowned for their accuracy in matters of detail; they endeavoured to reject all names for which there was not good authority, and to restore all which were authentic. Both restored "Fort La Tour," and both for reasons we do not understand, and which indeed do not greatly concern our present purpose, placed it upon the west side of the harbour, at Old Fort Point, in Carleton,[2] as is most clearly shown upon the annexed sketches (Nos. 5 and 6). Very many later maps follow them exactly, but I find none earlier that give this feature. Now even had we no other evidence upon this point, the testimony of these two maps, made so long after the destruction of Fort La

[1] As Mr. Hannay points out, two or three references to the Carleton fort speak of its small size.

[2] Bellin, in his description of his 1755 map, says, p. 41: "Sur la Pointe occidentale il y a un petit fort nommé Fort La Tour." In 1755 then he clearly thought Fort La Tour had stood upon the west side.

Tour, and when its site might well have become confused with the other forts built by the French about the harbour between 1690 and 1750, could not be considered as of much value in comparison with that of the earlier and nearly contemporary maps made in Paris, near the best sources of information, before any other forts were built. But happily we *have* other satisfactory evidence. Two years later (in 1757) Bellin issued a new edition of his map of Acadia, corrected in several respects, and upon that, as shown by the sketch herewith given (No. 7), he places the fort upon the east side, marks its position by the conventional circle, and then calls it "Ancien Fort La Tour," and renders it absolutely

No. 7.—Bellin, 1757.

certain to what this legend refers by joining the two by a short line of dots. The use of the word "ancien" here is most significant; it appears upon no other map I have seen. Is there any way of avoiding the conclusion that Bellin, after his 1755 edition, had seen evidence which satisfied him that the true ancient Fort La Tour had stood not upon the west but upon the east side, and that he therefore placed it in the latter position in his second edition, adding the word "ancien" to show that he referred to the real *old* fort which La Tour built?[1] D'Anville himself published no later edition of his map, so we cannot know what his later opinion would have been. Bellin's 1755 map was extensively copied, while the 1757 map was not. This is probably due to the fact that the former was issued separately as an ordinary map, while the latter appeared only in a volume of the work "Histoire générale des voyages," (vol. XIV). The testimony of the late maps which place Fort La Tour upon the west side appears by this to be quite nullified, and the statement seems therefore justified that all known cartographical evidence points us to the east side of St. John Harbour for the site of Fort La Tour.

The succession of forts in the harbour would seem to be as follows: in Carleton, at "Old Fort," Charnisay's, Villebon's, Fort Frederick; at Portland Point, Fort La Tour.

I know of no evidence, documentary or cartographical, and no line of argument from induction, or from indirect evidence of any kind which I have not mentioned, which is opposed to the conclusion to which I have been forced and which is discussed in this paper.

In conclusion, then, in the light of the fact that the only contemporary narrative we have, that of Denys, proves the fort could not have been at Old Fort Point, but, on the other hand, gives us strong reason for believing that it was at Portland Point, and in the light of the fact that all evidence from maps points to the east side of the harbour, where only a single fort site, that at Portland Point, is known, or has ever been recorded or referred to, does it not seem that it is at Portland Point we must find the site of Fort La Tour?

[1] It is well known that in 1750 the French had a fort on the Old Fort site in Carleton. This perhaps helped to confuse Bellin and d'Anville, who would have supposed that it stood on the old La Tour site.

APPENDIX.

From "Description géographique et historique des costes de l'Amérique Septentrionale" (Par Nicolas Denys, Paris 1672.).

L'Entrée de la riviere saint Jean, est de dangereux abord, rangeant la terre des deux côtez ; le meilleur endroit est du côté de Stribord ou main droite, sans trop approcher la terre : cette entrée est étroite, à cause d'une petite Isle qui est à Basbord, ou costé gauche, laquelle passée, la riviere est bien plus large : du mesme côté de l'Isle, il y a de grands marais ou prairies qui sont couvertes de plaine mer, le rivage est sable vaseux, qui fait une pointe, laquelle passée, il y a une ance qui entre dans lesdits marais, dont l'entrée est étroite, où feu Monsieur de la Tour avoit fait faire une écluse, où l'on peschoit un grand nombre de ces Gasparots que l'on faisoit saller pour l'Hyver, il s'y en peschoit quelques-fois une si grande quantité que l'on étoit obligé de rompre l'écluse, & de les jetter à la mer, autrement ils auroient empuanty l'écluse, qui en auroit esté perduë, on y trouvoit aussi quelques-fois des Saulmons, des Alozes, & du Bar, qui est le maigre de la Rochelle, qui servoit tous les Printemps d'une grande mâne pour ceux du pays.

Un peu plus avant, au delà de ladite écluse, il y a une petite butte, où d'Aunay fit bâtir son Fort que je n'ay pas trouvé bien placé à mon avis, pour estre commandé d'une Isle qui est tout proche plus élevée, & derriere laquelle tous Navires se peuvent mettre à couvert du Fort, dans lequel il n'y a que de l'eau de puits, qui n'est pas bien bonne non plus que celle qui est hors du Fort : Il auroit esté à mon avis mieux placé derriere l'Isle où moüillent les Vaisseaux, & où il auroit esté plus élevé, & par consequent point commandé d'autres endroits voisins, & auroit eu de bonne eau, comme dans celuy que fit bastir ledit feu sieur de la Tour, lequel fut rüiné par d'Aunay après s'en estre rendu le maistre assez injustement, n'y ayant aucun droit, ce qu'il auroit eu bien de la peine à executer s'il n'eust esté adverty de l'absence dudit sieur de la Tour, qui avoit mené avec luy une partie de son monde, & n'avoit laissé que sa femme avec le reste des siens à la garde du Fort ; laquelle aprés avoir soûtenu pendant trois jours & trois nuits toutes les attaques de d'Aunay, & l'avoir obligé de s'éloigner de la portée de ses canons, fust enfin obligée de ceder le quatriéme jour qui étoit le jour de Pasques, ayant esté trahie par un Suisse qui étoit en garde ce jour-là, pendans qu'elle faisoit reposer ses gens, esperant quelques relâches. Le Suisse se laissa corrompre par les gens de d'Aunay, & souffrit qu'ils montassent à l'assaut, qui fut encore soûtenu quelque temps par la Commandante à la teste de son monde, qui ne se rendit qu'à l'extrèmité, & sous condition que ledit d'Aunay donneroit quartier à tous, ce qu'il n'executa pas, car s'étant rendu maistre de la place, il les fit mettre tous en prison avec la Commandante, ensuite de l'avis de son conseil, les fit pendre, à la reserve d'un seul qui eut la vie sauve à la charge qu'il en feroit l'execution, & la Commandante les assista à la potence la corde au col comme auroit esté le plus grand scelerat : Voila le tiltre dont le Borgne s'est servy pour pretendre comme Creancier dudit sieur d'Aunay la proprieté de la riviere saint Jean.

IV.—*Language as a Test of Mental Capacity.*

By HORATIO HALE, M.A.

(Read May 26, 1891.)

As man is beyond question the highest being in animated nature, it might reasonably be supposed that anthropology, "the science of man," would rank highest among the natural sciences. Not only, however, has that prerogative not been conceded to this science, but the curious fact must be recorded that only within the last decade has even an equality with the other sciences been at last, very slowly and grudgingly, allowed to it.[1] This recent acknowledgment has been mainly due to two scientific developments, as they may be styled, both of the first importance. The earliest of these was the establishment of the fact, ascertained through the researches of Boucher de Perthes and his followers, of the great and hitherto unsuspected antiquity of man upon the earth. The other was the acceptance by the large majority of naturalists of the doctrine of evolution, as applicable to the human species, along with all other parts of the creation.

The reason why scientific men in general have hesitated so long, and still hesitate, to accord to anthropology its true position among the sciences, is one which must be said to do them no discredit. They have had what must be deemed a natural and reasonable feeling that this branch of science, as commonly studied, has no title to the special rank claimed for it. If man is merely an animal, and is not separated from other animals by a line as distinct as that which separates a tree from a stone, or a stone from a star, why should he claim a whole main department of science to himself, and not be content with his modest "subsection" along with the birds, the insects, the vegetables, and the other members of the great biological section? It must be admitted that the chief authorities in this science during the last thirty years, whether evolutionists or opponents of evolution, have offered no satisfactory reply to this objection. The reason of their failure is evident enough. With very few exceptions these eminent men have deliberately put aside the teachings of comparative philology on this subject, and have had recourse solely to evidences drawn from physiology. Yet it is certain that the grand characteristic which distinguishes man from all other mundane beings is articulate speech. It is language alone which entitles anthropology to its claim to be deemed a distinct department of science. Until this truth is clearly understood, scientific men in general will

[1] It was not until the year 1882 that in the American Association for the Advancement of Science, at its thirty-first annual meeting, anthropology was raised from the humble position of a "subsection," or mere department of another science, to the rank of a full "section." Two years later, a similar advance in dignity was accorded to the science in the British Association, at its fifty-third meeting. By a rather singular coincidence both meetings took place in Montreal, and the writer had the fortune of being present on both occasions and taking some part in these tardy honours paid to a science to which he had made his first published contribution, in a very humble fashion, while an undergraduate, nearly fifty years before.

have a right to look askance upon the pretensions of a so-called science which has no established laws, lays down no definite principles, and puts forth no conclusions which claim any higher assurance than that of plausible conjectures. If geology or biology were in the same position, who would venture to claim for them the distinction of true sciences?

The two main grounds on which are rested the claims of language to be deemed the true basis of anthropology are: first, its position as the only certain test of the affinities of races; and, secondly, its not less important position as the only sure test of the mental capacity of any race. The first of these grounds has been discussed in a former essay. In a paper read in 1887, at the meeting of the American Association for the Advancement of Science, under the title of "The True Basis of Ethnology," and published in the 'Popular Science Monthly' for January, 1888, under the title of "Race and Language," I endeavoured to bring together the evidence and authorities in support of the proposition that in language, and language alone, is to be found the true criterion of the genetic relationship of any two populations. It will be enough, perhaps, for the present to say that these arguments have been tersely and happily summed up by the most eminent of living philologists, Prof. Max Müller, who, in the third lecture of his recent publication, "Three Lectures on the Science of Language and its place in General Education," fully accepts this proposition, and confirms it by many illustrations and arguments.[1] I may add the practical example of my distinguished friend, Dr. D. G. Brinton, who in his admirable work, "The American Race," has deliberately put aside all other tests, and has based his classification of the tribes of this continent solely on the distinction of linguistic stocks. But in referring to this subject on the present occasion, my only object is to disclaim for myself any title to originality in the conclusions which have been thus powerfully sustained. These conclusions were derived from the writings of two American philologists of earlier days, Peter S. Duponceau and Albert Gallatin (both, indeed, of European birth—the one French and the other Swiss), who in their works laid the foundation of American ethnology; and their conclusions have been sustained by a very eminent authority, Theodore Waitz, once deemed, before the present physical school acquired its undue predominance, the chief of German anthropologists. The first volume of his great work, "Anthropology of Primitive Races," was translated and published in London in 1863 for the Anthropological Society of that city, as the best existing introduction to the science for whose study the society was established. In this volume he lays down the proposition, and illustrates it with abundance of facts and arguments, that "the scientific method at present applied in comparative philology possesses a higher degree of authenticity, and offers better guarantees for its results, than the methods of physical anthropology and craniology." He shows also the futility of the common objection that men may change their language, but not their physical appearance. As he points out, and as history confirms, no people ever yet changed its language until it had become so intimately mingled with another people as to receive from them, along with their language, a large infusion of their blood. The common—one might almost say the vulgar—instance on the other side is that of the negro, or rather the "negroid," populations of the Southern United States and the West Indies. All these populations speak some language of Aryan origin,

[1] "I agree with Mr. Horatio Hale that the most satisfactory, nay the only possible division of the human race is that which is based on language."—"Three Lectures," etc., p. 49.

and on the principles of linguistic ethnology should be regarded as Aryans—which, say the objectors, they certainly are not. But this assertion simply betrays in those who make it an ignorance both of historical facts and of scientific principles. The name of Aryan originated in ancient Bactria and northern Hindostan. Some three or four thousand years ago a light-hued people, composed of wandering herdsmen, descended from the northwest, in Tartar-like hordes, upon the plains of northern India, then occupied by swarthy tribes, whose descendants are now known as "Dravidians" and "Kolarians." These communities of Indian negroes, as far south as the Godavery River, were subdued, and in great part absorbed, by the invading bands. Other conquering hordes of the same light-hued race descended upon southern Europe, overpowered and assimilated its brown-skinned populations (probably of North African origin), received their southern colour, and gave them their own northern language. If we give the name of Aryan to the dusky people of northern Hindostan and the brunette nations of southern Europe, why should we refuse it to the swarthy people of America, who speak languages of the same stock and have probably an equal infusion of Aryan blood? It should be borne in mind that among the negroid communities in the United States and the West Indies very few individuals of pure African blood remain. There is probably not one in a hundred, certainly not one in ten, who has not some infusion of Aryan blood. In our scientific classification the Aryo-Dravidian nations of Hindostan and the Aryo-Iberian nations of southern and western Europe are all styled Aryans. Is there any good reason for refusing the same style to the Aryo-African inhabitants of America? The only reason (and that not a scientific one) is the sentiment that the negroid Africans stand on a lower intellectual grade than that of the negroid Dravidians or the swarthy Iberians. If such a prejudice exists, the surest way of dispelling it is by a study of the original languages of these races. It will appear that many of the African languages stand on at least as high a grade as that of the Iberian or Dravidian tongues. And this, it may be added, is not saying little, for the character of these tongues evinces a high intellectual capacity in the people who speak them.

We are thus brought to the main subject to which the present essay is devoted—the consideration of language as the test of mental capacity. And here it is just that a tribute should be paid to the candour and discernment evinced by Darwin in relation to this subject, a discernment which contrasts markedly with the blindness of some of his followers, who are physiologists and nothing else. The transcendent value of language in the intellectual equipment of the human species was clearly apparent to him. I quote the whole of the striking paragraph (Section 73 of "The Descent of Man") in which his views are set forth:—"Man in the rudest state in which he now exists is the most dominant animal that has ever appeared on this earth. He has spread more widely than any other highly organized form; and all others have yielded before him. He manifestly owes this immense superiority to his intellectual faculties, to his social habits, which lead him to aid and defend his fellows, and to his corporeal structure. The supreme importance of these characters has been proved by the final arbitrament of the battle for life. Through his powers of intellect, articulate language has been evolved, and on this his wonderful advancement has mainly depended. As Mr. Chauncey Wright remarks: 'A psychological analysis of the faculty of language shows that even the smallest proficiency in it might require more brain power than the greatest proficiency in any other

direction.' He has invented and is able to use various weapons, tools, traps, etc., with which he defends himself, kills or catches prey, and otherwise obtains food. He has made rafts or canoes for fishing or crossing over to neighbouring fertile islands. He has discovered the art of making fire, by which hard and stringy roots can be rendered digestible, and poisonous roots or herbs innocuous. This discovery of fire, probably the greatest ever made by man, excepting language, dates from before the dawn of history. These several inventions, by which man in the rudest state has become so pre-eminent, are the direct results of the development of his powers of observation, memory, curiosity, imagination and reason. I cannot, therefore, understand how it is that Mr. Wallace maintains that 'natural selection could only have endowed the savage with a brain a little superior to that of an ape.' "

To the views so eloquently and convincingly expressed, only one qualification seems to be required; but that is one of the greatest importance. Articulate language is spoken of as an acquired art, a "discovery of man." If the habit of walking upright was a discovery of man, then in the same sense we may doubtless accept the use of speech as his discovery. But from what we know of the bodily structure of the human species, we are sure that the first members of that species, however they may have come into existence, must, after passing the period of infancy, have assumed the upright position. And from our knowledge of the vocal organs and the brain of the human species, we may be equally sure that the first human beings who had passed beyond the infantile stage must have spoken to one another in articulate language. Furthermore, as we have every reason to believe that the first human beings were as tall, as strong, and as active as any of their descendants, so we have equally good reason to believe that the language which they spoke was as well constructed and as expressive as any language that is now spoken.

This assertion may at first thought seem startling, but I believe that the more carefully it is considered and discussed, the more clearly its reasonableness will be apparent. Fortunately, however, we are not reduced to mere analogical reasoning for evidences of its truth. This can be abundantly shown by an analysis of the languages spoken by those tribes of men who, in the opinion of all anthropologists, are now in the lowest stages of culture. If it shall appear that some of these languages are as well organized and as expressive as those of the most civilized nations, it will be evident that the capacity for speech, like the capacity for walking erect, has nothing to do with culture, and that, as I have elsewhere said, to talk of "barbarous languages" is as absurd as it would be to talk of barbarous complexions, barbarous hair, or barbarous lungs.

It is deserving of remark that for the materials of the study into which we are now about to enter, we shall be indebted almost entirely to the labours of missionaries. There can be little question that one reason why linguistic anthropology, which treats man as an intellectual and moral being, has of late years been superseded by physical anthropology, which treats him as a dumb brute, is that the pursuit of the latter science—if science it can be called—is so infinitely the easier. To measure human bodies and human bones,—to compute the comparative numbers of blue eyes and black eyes in any community,—to determine whether the section of a human hair is circular, or oval, or oblong,—to study and compare the habits of various tribes of man, as we would study and compare the habits of beavers and bees,—these are tasks which are comparatively

simple. But the patient toil and protracted mental exertion required to penetrate into the mysteries of a strange language (often without the aid of an interpreter), and to acquire a knowledge profound enough to afford the means of determining the intellectual endowments of the people who speak it, are such as very few men of science have been willing to undergo. Only in rare cases has a Lepsius among the Nubians, or a Washington Matthews among the Hidatsas and Navajos, been found equal to the task. Many have gathered vocabularies, which have been useful in determining the affiliations of races, but which unfortunately at the same time, through their necessary imperfections, have given rise to gross errors,—such as the current opinions that the languages spoken by barbarous peoples are poor in expression, have few general or abstract terms, have no substantive verbs, and no real inflections. For the proofs which enable us to dispel these errors, and to disclose the true character of these languages and the capacity of the people who speak them, we are indebted mainly to the enlightened and indefatigable efforts of missionary zeal.

One of the most remarkable products of this zeal is the huge folio volume of the Rev. Father E. Petitot, on the language of the "Dènè-Dindjié" Indians, published in 1876 by the distinguished explorer, M. Alphonse L. Pinart, in his valuable "Bibliothèque de Linguistique et d'Ethnographie Americaines," and representing the results of twenty years of labour in one of the most uninviting regions of the earth. The "Dènè-Dindjié" are the Indians known to American ethnologists as Athabascans (a name given to them by Gallatin in his well-known "Synopsis of the Indian Tribes"),—and later and more generally as the Tinneh people. *Tinnè*, *dènè*, *dindjié* are three of the numerous dialectical forms (including also *tènè*, *danè*, *dunè*, *tŭnna*, *adŭna*, *thinneh*, etc.) which the word for "man" assumes in the numerous septs of this great family, occupying the whole of that North American Siberia which spreads (south of the Eskimo) from Hudson Bay on the east to Alaska on the west, including also the northern interior of British Columbia and part of its sea-coast. It is a dreary region of rocks and marshes, of shallow lakes and treacherous rivers, offering no attractions except such as the hunter finds in the numerous fur-bearing animals which roam over it and afford to the native tribes a precarious subsistence. When this resource fails, they live on lichens, which they gather from the rocks. Their dwellings are tents of skins, or rude huts made of the boughs of the stunted trees which here and there grow in the scanty soil. The people live in small scattered bands, with little of what can be called a social organization. M. Petitot depicts them with a strictly impartial pencil.

In bodily aspect, he tells us, they differ from the Eskimo, and resemble more nearly their southern neighbors, particularly the Sioux. They are tall and slender, with high but receding foreheads, wide cheek-bones, and prominent brows, beneath which the large eyes gleam with an ophidian lustre. The heavy upper eyelid, a little oblique, lends often to the glance something peculiarly suspicious and distrustful. The straight shining black hair descends in heavy locks over the eyes and shoulders The colour varies, but though clear, is never so white as that of Europeans, having always a tinge of brown.

In character the Tinneh people unite, in our author's opinion, the usual defects of savages with more good qualities than are ordinarily combined with these defects. Their hard life makes them selfish, proud, severe towards women and old and weak people—though blindly indulgent to their children—and also cowardly, lazy and deceitful. But,

he adds, "how many other vices commonly ascribed to savages are unknown to them!" They are humane and gentle to their equals,—are sober and averse to strong liquor; they are not vindictive; theft, rage, and violence are unknown among them. They are eager for instruction, and inquire about everything, like children. They do not lack sagacity and penetration; but he adds the remark which will be found significant,—"their intelligence is evidently in the swaddling clothes of infancy; their faculties are, so to speak, benumbed or shackled by a bar, which is nothing else than that forced and abnormal condition which we style barbarism."

The language spoken by these people, as it is fully analyzed and minutely set forth by the author, is one of the most remarkable emanations of the human intellect. It possesses all the qualities and constituents which persons not familiar with the discoveries of modern philology are wont to regard as peculiar to highly cultivated idioms—capacity for varied expression, wealth of inflections, aptitude for word-formation, the substantive verb in different forms, and many auxiliary verbs. To give even an outline of this extraordinary language would take us beyond the reasonable limit of such an essay as the present. A few examples, selected as fair specimens, must suffice.[1]

The primary roots of the Tinneh language, as of the Sanscrit, are all monosyllabic, and usually have a signification of a general or abstract character; thus, *thay*, sand, really signifies "the minute, decomposed object"; *shion* signifies age, maturity; *tthen*, bone, is understood properly to mean "the long hollow object." From these are made secondary roots by prefixing or adding a particularizing vowel—*thayé*, minute, broken up; *edjion*, ancient; *etthæn*, bone. There are other derived roots or "themes" formed by prefixing to the simple roots various particles, as *de*, *dæ*, *ne*, *kwè*, *in*, sometimes with a slight euphonic change in the root. Thus, from *thay* (the minute, sand-like object), we have *dedhay* (the *dh* pronounced like *th* in *this*), meaning salt (that which resembles sand); from *shion* we have *nelshion*, grown up (that which has come to maturity); from *tthen* we have *dætthæn*, hard (*i.e.*, bone-like), and with two particles *in* and *kwè* prefixed and combined, replacing the initial consonants of the root, *inkwènè*, hollow and long (like a bone).

One of the most notable of these derived forms is the word for *man*. *Ni* or *ne* (which as a monosyllable usually has the consonant duplicated,—*nni* or *nne*,—to express an emphatic pronunciation, is the Tinneh root-word for "earth." The particle *de* (otherwise in various dialects pronounced *di*, *te*, *ti*, *tæ*, *thé*, etc.,) which conveys the meaning of "that which is of," or "that which pertains to," is prefixed to this monosyllable to form the derivative term for man (*tinnè*, *dènè*, etc.) already referred to. Man is pre-eminently the being that pertains to the earth. The word corresponds, not with the Latin *vir*, but with *homo*, and in its plural acceptation means "people." It is used, like the German *man* and the French *on* (a contraction of *homme*), as an indefinite personal pronoun in

[1] In the words of the aboriginal languages quoted in this paper, the "scientific orthography" has been employed. The elements of this orthography may be briefly described in the phrase "vowels as in Italian (or German), consonants as in English." The only additions here required are the *œ* to represent the short *u* in *but* (French *eu*, German *ö*); the Spanish *ñ* to indicate the nasalized *n*,—sometimes weak, as in the French *bon*, sometimes stronger, like our *ng* in *singer*; and the apostrophe (') affixed to various consonants and some vowels to give them an aspirate or guttural sound, as k' to express the German *ch* or Spanish *j*, and *r'* to indicate a strongly guttural *r* (*r grasseyé*). Slight variances of pronunciation are not important in studies of the present cast.

phrases corresponding to the "*man sagt*" and "*on dit*" of those languages. (*Dènè asel'ni, on me l'a dit; dènè ze'li, on imite*). It even becomes, on occasions, an indefinite article (but generally in an abbreviated form), when referring to human beings or to parts of the human body, as with *et'a*, father, *denet'a*, *a* father (lit., some one's father); *inla*, hand, *deninla*, a hand (i.e., some one's hand). The working of the combined powers of deduction, abstraction, and generalization has rarely been exhibited in any language more strikingly than in the formation and use of this word.

It is, however, as might be expected, in the Tinneh verb that the capabilities of the language in the way of expression are most fully shown. In many other American languages, as is well known, the verb possesses an immense variety of minutely expressive forms, which, when these languages were first studied, awakened much wonder and admiration. Later on, when the physiological and "brutal" view of anthropology overpowered for a time its philological and intellectual aspect, a period of depreciation set in. Even the always candid and usually careful Darwin was so far influenced by the arguments of his ill-informed followers that he allowed himself to speak slightingly of "the extremely complex and *regular* construction of many barbarous languages," as a sign of immaturity and imperfection. If extreme complexity in language is a mark of low organization, the Greek of Plato and the Arabic of Avicenna must take a very humble rank. On the other hand, if irregularity of grammar gives a claim to admiration, then the most complex of American languages, the Iroquois, Algonkin and Tinneh, may fairly rank beside those exceedingly irregular tongues, the Homeric Greek and the Vedaic Sanscrit.—both of which, it might be added, should, in reference to the condition of the people who spoke them, be classed as "barbarous languages,"—so little did Darwin, or rather his authorities, with all their classical attainments, know of the first principles of modern philological science. To find a perfectly regular language we must look, not to barbarous tribes or civilized nations, but to the inventors of Volapük and other artificial creations of the sort.

It will not be necessary to dwell on the points in which the forms of the Tinneh verb resemble more especially those common to it with others of the highly organized American languages—the numerous conjugations, the pronominal transitions from subject to object, and the like. But certain special facts must be noticed which will show its claim to be ranked in the intellectual scale on the same level with the most notable linguistic families of the old world. It possesses and constantly employs the substantive verb in various forms. The root of the principal form is *li*, of which the present tense, with the personal pronoun prefixed, is as follows:—

Singular.		Dual.		Plural.	
esli,	I am.	*idli*,	we two are.	*yaidli*,	we are.
nenli,	thou art.	*ali*,	ye two are.	*yaul'i*,	ye are.
enli,	he is.	*kenli*,	they two are.	*k'eyonli*,	they are.

Examples—*dènè nenli*, thou art a man (*homo es*): *uya enli*, he is ashamed; *nezun esli*, I am good. In Tinneh, however, as in other American languages, the use of the independent substantive verb with adjectives can be avoided by incorporating the two in one word, and using, instead of *nezun esli*, *nezun nenli*, *nezun enli*, the abridged forms, *nessun*, *ninzun*, *nezun*, for I am good, thou art good, he is good.

Exactly as in the Aryan languages, this substantive verb becomes an auxiliary verb in forming secondary tenses of other verbs. With certain particles, *wa*, *wo*, etc., prefixed to the root *li*, it helps to make the future or conditional form, thus resembling, as M. Petitot remarks, the English shall, will, should, and would. Thus, *daedi*, they say, has in the future or "eventual" tense, *daedi walli*, they will or would say.

Another very common auxiliary verb has for its root *le*, considered by M. Petitot to be the same as the word *hand*, which is *la* or *le* in different dialects. He compares its use as an auxiliary and in other respects to that of the English *do*. It may be well to give a part of its conjugation, to show the error of the common notion,—which was long since exposed by Duponceau, but constantly crops up,—that American languages have not proper inflections, but only agglutinative forms:

PRESENT TENSE.

asl'é,	I do.	*adailyé*,	we do.
anélé,	thou dost.	*adaul'é*,	ye do.
anlé,	he does.	*adanlé*,	they do.

PAST TENSE.

asl'a,	I did.	*adailya*,	we did.
anenla,	thou didst.	*adaul'a*,	ye did.
anla,	he did.	*adanla*,	they did.

The difference between *anlé*, he does, and *anla*, he did, is as clearly inflective as that which exists in Latin between *facit* and *fecit*. Many still more striking examples could be given; but for any who have studied these languages they will be needless. We may turn to certain classes of verbs which vary in their terminations and forms of conjugation according to the nature of the actions or ideas which they express, such as "verbs of motion," "instrumental verbs," "verbs of mental actions," and the like. That there should exist in a language of wandering savages a distinct class of verbs with peculiar terminations entirely devoted to expressing the operations of the mind will seem to many persons surprising. The surprise, however, will proceed wholly from that prejudice of race which refuses to regard the people of other and especially of less cultured races than our own as endowed with natural capacities equal, and possibly superior, to those which governed our forefathers in the formation of our speech.

The "verbs of mental actions" comprise all verbs expressive of operations of the intellect and feelings, including thought, mental suffering, passion, will, and the like. They are classed in no fewer than eight conjugations, distinguished by their terminations, each conjugation having its own special form in the present, past, and future tenses. Thus *yenesshen*, I think, of the second conjugation, has in the preterite *yenidhi*, I thought, and in the future (or "eventual") *yenusshi* I shall or may think. *Naosshær*, I commit, has for preterite *naosthilshær*, and for its future *naæussthir*. It should be observed (as the last example may indicate) that the expression "mental actions" includes in this language a much wider scope than might at first thought be suspected. To this class belong not merely verbs meaning to pity, to trust, to hate, to aspire, and the like, but the verbs to punish, to forbid, to be free, to be hungry (i. e., to desire food), to kill (indicating an action of the will), and even to die, which is apparently regarded as the cessation of mental power.

Any neuter or intransitive verb may be made transitive or receive a causative signification by inserting the sound of *l*, derived from *le*, to do. Thus *yenidhen* signifies he thinks,

while "he thinks him good" would be *nezun ye yenildhen*, lit. "good him he deems." So *danutsar*, we weep; *da-ne-nul'tsar*, we cause thee to weep, where *da* is we, *ne* is thee, and the inserted *l* (which is aspirated for emphasis) puts the verb in the causative form.

This brief summary, or rather this series of extracts, gives only an imperfect idea of the wealth of this language, not only in forms of expression, but in the ideas which it expresses. If it be thought that this wealth is far beyond anything that the circumstances of the people can require, there are two considerations which should be borne in mind. In the first place we must remember that the life of savages, like that of civilized men, is full of exigencies demanding the exertion of many mental faculties, and calling for an endless variety of communications between the members of a household or of a tribe. Secondly, there is in every healthy human mind, as in every healthy human body, evidence of an immense reserved force, ready for development to an almost unlimited extent. The recruiting serjeant sees, in the movements of an awkward but strongly framed rustic, evidence of the thews and sinews which will in time make the lithe and prompt artilleryman; and the philologist perceives in the speech of the savage the promise of capacity for any duties of civilization.

In the case of the Tinneh we are fortunately not limited to inference and prediction. The capabilities of the race have been strikingly shown. The "Tinneh (or Athabascan) family" is a widespread one, diffused over a larger portion of North America than any other linguistic stock, except perhaps the Algonkin. As in the other hemisphere, so in this, the tribes of the bleak and barren north have sent out their swarms toward the sunny and fertile south. Ethnologists have traced their line of march by the fragmentary septs which have remained along the track, from the Mackenzie basin and Alaska, through the regions which are now the Province of British Columbia and the States of Washington and Oregon—where the Sikanis, the Takullis, the Kwalhiokwas, the Umkwas, the Totutunies and other remnants still linger,—to the fruitful river-valleys of Northern California. Here for a time the emigrants halted, and their natural capacities and character found room for development. Mr. Stephen Powers, in his excellent description of the Californian Indians, which composes the third volume of the Smithsonian "Contributions to North American Ethnology," gives a brief account of the Hupâ, or Hoopas, who occupy Hoopa Valley on the Lower Trinity, north of San Francisco. Their most notable characteristic is their masterful force of character. In a vigorous passage, which I slightly condense, he tells us: "Next after the Karoks they are the finest race in all that region, and they even excel them in their statecraft, and in the singular influence, or perhaps brute force, which they exercise over the vicinal tribes. They are the Romans of Northern California in their valour and in their wide-reaching dominions They are the French in the extended diffusion of their language. They hold in a state of semi-vassalage most of the tribes around them, exacting from them annual tribute in the shape of shell-money; and they compel all their tributaries to speak Hupâ in communication with them. Although most of these petty tributaries had their own tongues originally, so rigorously were they put to school in the language of their masters that most of their vocabularies were sapped and reduced to bald categories of names. They had the dry bones of substantives, but the flesh and blood of verbs were sucked out of them by the Hupâ. A Mr. White, a pioneer well acquainted with the Chimalakwe, who once had an entirely distinct tongue, told me that before they became extinct they scarcely employed a verb which was not Hupâ. I tried in vain to

get the numerals of certain obscure remnants of tribes; they persisted in giving me the Hupâ, and in fact they seemed to know no other."

But these proud and masterful children of the savage north had been quick to adopt all the arts of incipient civilization which they found in their new abode. Their dress, implements, and houses were copied from the neighbouring tribes of the Klamath River region. The Californian currency of shell-money, which had been found highly useful in trade, was adopted by them, with certain changes in rating. One of their septs, the Tolowa, were noted for their large and handsome canoes. Mr. Powers saw one which was forty-four feet long, over eight feet wide, and capable of carrying twenty-four men or five tons of weight. It was made of redwood cedar, and seemed to him a "thing of beauty," sitting plumb and lightly on the sea, and so symmetrical that a pound's weight on either side would throw it slightly out of trim.

But the Californian valley proved too narrow for the increasing population, which sent forth new swarms to the far south-east. From one of these sprang the terrible Apaches, whose rapacious and far-swooping bands became lords of the plains and hills from the Californian gulf to Texas, and dominated for two centuries the feeble provinces of Northern Mexico,—now ravaging the settlements and now contemptuously selling them peace. A still larger swarm made its way into the highlands of Arizona and New Mexico, and found a genial abode in the sunny and grass-clad mountains which surround the stone and brick edifices of the half-civilized Pueblo Indians. These Indians had dreaded the mountains as the resort of the predatory Utes of the Shoshonee stock. The fearless Tinneh emigrants, who have since become famous under the Spanish nickname of Navajos,[1] seized these inviting uplands for their own fastnesses, drove back the Ute invaders, made friends with the Pueblo Indians, and quickly learned from them their methods of agriculture and their mechanic arts. "When the Spaniards first met them, in 1541, they were tillers of the soil, erected large granaries for their crops, irrigated their fields by artificial water-courses or *acequias*, and lived in substantial dwellings, partly underground; but they had not then learned the art of weaving the celebrated 'Navajo blankets,' that being a later acquisition of their artisans."[2]

It is admitted on all hands that if they learned their mechanic arts from the Pueblos, they greatly improved these industries. Their blankets are as famous throughout the south-west as the carpets of Persia are throughout Asia. Dr. Washington Matthews, the highest authority on all matters relating to this people, in his elaborate monograph on "Navajo Weavers" (published in the third annual volume of the Bureau of Ethnology), remarks: "It is by no means certain—still there are many reasons for supposing—that the Navajos learned their craft from the Pueblo Indians, and that, too, since the advent of the Spaniards; yet the pupils, if such they be, far excel their masters to-day in the beauty and quality of their work. It may be safely stated that with no native tribe in America, north of the Mexican boundary, has the art of weaving been carried to greater perfection than among the Navajos, while with none in the entire continent is it less Europeanized."

In silver-work, according to the same authority, the superiority of the Navajo artisans

[1] Said by some to mean the Lake-people, by others the Cornfeld-people. *Navajo* signifies both a pool and a plot of level ground.

[2] Brinton's "American Race," page 72; citing A. A. Bandelier, "Indians of the Southwestern United States."

to those of the Pueblos, in natural aptitude and taste, is equally apparent. With inferior implements and under other disadvantages, they do equal or even better work.[1] In a letter with which Dr. Matthews has recently favoured me, he writes of this people: "Their own traditions and the works of early travellers show that they have made great advances in the last two or three centuries. This is partly due, no doubt, to contact with Pueblos and whites, and partly to admixture of the blood of these races; but it must be largely attributed to some innate docility of the Navajo stock. Many of the wild tribes of these parts have had exactly the same advantages, and yet have not advanced as the Navajos have done. Their silversmiths have, without any instruction, greatly improved their art within the last six years. They have discovered for themselves methods of ornamenting in *repoussé* and by means of dies. Their weavers have invented some important improvements. Navajo progress forms a subject of great interest, and its causes are not easy to determine. They would probably have earlier become dwellers in permanent houses but for their superstitious notions, which constrain them to abandon a house where a death has occurred. Quite recently some of the less conservative have renounced these notions, and built themselves houses of stone."

But the intellectual powers of this remarkable people are displayed by evidences of a far higher cast than works of agriculture and mechanic arts. Their literary compositions, as they may justly be called, their religious and legendary chants, evince vivid imagination, a talent for clear and forcible expression, and a capacity for sustained and impressive narration, which no barbarous and few civilized races have surpassed. Our knowledge of those compositions is due also to the same discerning and indefatigable investigator. "The Prayer of a Navajo Shaman," which Dr. Matthews has preserved for us (in the 'American Anthropologist' for April, 1888), is not so much a prayer as the relation of an intensely interesting religious or mythological experience. It is the story of a descent into the underworld for the recovery, not of a lost soul, but of a stolen "spiritual body," which had been carried off by the chief of witches for the purpose of working woe to the visible body and to the soul of the rightful possessor, remaining on the earth. In answer to his supplication the two principal war-gods of the Navajo pantheon come from their abodes on the summits of the neighboring mountains, and descend into the lower regions, passing gate after gate, which, though guarded by direful sentinels, yield before their magic wands. In the lowest depths they recover the fragments of the lost body, which resume their proper form, and the three return upward, through chamber after chamber, until the suppliant reaches his home, when his spirit, body, and soul are reunited, and "the world around him is restored in beauty." This is but a feeble outline of a composition which when read is most impressive. In all the legendary lore which the Assyrian tablets have yielded to modern explorers there are few more interesting stories than that of the descent of the goddess Ishtar into Hades, to confront the awful queen of that realm, and recover (as is supposed) her lost lover Thammuz, and of her restoration to the upper world.[2] The incidents bear, in certain respects, a very curious resemblance to those of the Navajo legend. But as compositions, and viewed merely as displays of literary

[1] "Navajo Silversmiths," by Washington Matthews, in the second annual 'Report of the Bureau of Ethnology,' p. 171.

[2] See Rawlinson's "Religions of the Ancient World," chap. 2, referring to Fox Talbot, "Records of the Past," pp. 143-149.

genius, there is no comparison between the two narratives. It would be hard to deny to the ancient Assyrians the title of a civilized people; yet it must be said that their solemn record of the "descent of Ishtar," striking as it certainly is, becomes childish and barbarous when compared with the Navajo Shaman's "Prayer of the Rendition."

The Navajo "Mountain Chant," given by Dr. Matthews in the fifth 'Annual Report of the Bureau of Ethnology,' is a much longer and more elaborate composition, a narrative of great and varied interest, comprising historical and mythological details in vast profusion, and illustrated by many dramatic ceremonies, with numerous songs and dances, and some curious aboriginal drawings. The same exuberant yet regulated imaginative power is apparent in this as in the former production.

Certain points in the social system of the Southern Tinneh require special notice The origin and character of the Navajo and Apache *gentes* have been well described by Dr. Matthews and Captain John G. Bourke in the April-June number of the American "Journal of Folk-lore" for 1890. These *gentes*, or clans, if they may be so styled, seem all of comparatively modern origin, and apparently correspond to nothing found among the Northern Tinneh, east of the Rocky Mountains. Another and far more profound change is a matter of much greater moment. The condition of women among the Navajos is as far as possible removed from that of the tribes described by M. Petitot. Among these tribes women are slaves; among the others they are queens. With the Northern Tinneh, wives are drudges, bought, unwooed, unloved, and abused. With the Southern Tinneh, they are won by courtship, are regarded by their husbands with the warmest affection, hold their own separate property, and are consulted in all transactions of business. The change in their position is not unknown to the people themselves. It is, in fact, the subject of a curious legend, which Dr. Matthews has recorded.[1] There was a time in their early history when the men and women fell out. The women declared themselves tired of drudging for their husbands, and the sexes agreed to separate. They took opposite sides of the river on which they lived, and thus dwelt apart for four years. Then the women wearied of the separation, and wanted the help of the strong arms of their husbands. They cried across the river and begged to be taken back. While the men hesitated and debated, some of the women tried to swim across and were drowned. This decided the question, and the men took back their wives. It would be absurd to suppose that such an event really occurred, but the legend embodies the unquestionable fact of a notable change in the relation of the sexes. Nor can there be any reasonable doubt as to the origin of this change.

The common opinion that women among savage tribes in general are treated with harshness, and are regarded as slaves, or at least as inferiors and drudges, is, like many common opinions, based on error, originating in a too large and indiscriminate deduction from narrow premises. A wider experience shows that this depressed condition of women really exists, but only in certain regions and under special circumstances. It is entirely a question of physical comfort, and mainly of the abundance or lack of food. Where, owing to an inclement climate, as in arctic or sub-arctic America, or to a barren soil as in Australia, food is scanty, and the people are frequently on the verge of famine, harsh conditions of social life prevail. When men in their full strength suffer from lack of the

[1] See "A Part of the Navajos' Mythology," in the 'American Antiquarian' for April, 1883.

necessaries of existence, and are themselves slaves to the rigours of the elements, their better feelings are benumbed or perverted, like those of shipwrecked people famishing on a raft. Under such circumstances the weaker members of the community—women, children, the old, the sick—are naturally the chief sufferers. The stories of the subjection of women, and of inhumanity to the feeble and aged, all come from these inhospitable regions. Where plenty prevails, as in tropical or sub-tropical America, and in most of the Polynesian islands, the natural sentiments resume their sway, and women are found to enjoy a social position not inferior, and sometimes actually superior, to that which they possess in some civilized countries. The wife of a Samoan landowner or a Navajo shepherd has no occasion, so far as her position in her family or among her people is concerned, to envy the wife of a German peasant. The change which took place in the social condition of the Tinneh women, when their emigration had carried them from the bleak skies and frozen swamps of Athabaska to the sunny uplands and fruitful valleys of Arizona, is thus simply and naturally explained. The change was doubtless the greater because they shared with their husbands the remarkable intellectual endowments indicated by the qualities of their common language.

In another respect the influence of the emigration on the social, or rather the civil, organization of the Southern Tinneh, is not such as, according to the ordinary political theories, might have been expected In passing from the status of savagery to one nearly approaching to civilization, no change has been made in their peculiar and surprising system of government, if such we may term that which is really "no-government." In fact, the only word which can describe it is one which has of late years acquired a grim significance; it is simple "anarchy." M. Petitot first draws our attention to this Tinneh characteristic, and to the peculiar quality of mind which renders it possible—the utter absence of vindictiveness. "It is," he remarks, "a singular fact, and one which must give a high idea of the gentleness (*douceur*) of the Dènè-Dindjié, that though they are without any kind of government, of judges, or of laws, we nevertheless do not encounter among them any of those crimes which result from vengeful feelings—only the weaknesses which belong to our nature. The penalty of retaliation, the right of reprisal, that sort of lynch-law recognized as justice and equity among Indian tribes of other stocks, do not exist among this people. Exceptions occur, but they only confirm the general rule." The so-called chiefs, we are told, whom the people assume, or rather whom the Hudson Bay officials give them, have no other prerogative than that of directing their hunting parties and their trips to the trading posts.

Mr. Powers makes a singularly like report concerning the warlike Hupâ, those conquering Romans of Northern California. "Politically," he tells us, "the Hupâ are fatally democratic,"—though why the expression "fatally" should be applied to this prosperous tribe is not apparent. "There is no head-chief," he assures us, "even for war." Every man fights as he chooses, only taking care to keep near the main body of the warriors. They have, indeed, "well-established laws, or rather usages," as regards both civil rights and personal injuries, but the methods of dealing with these evince the same placability as that which M. Petitot records. "For instance," Mr. Powers explains, "if two Hupâ have a quarrel, and it is not settled on the spot, they refuse to speak to each other; but if after a while one desires to open friendly relations, he offers to pay the other

man a certain amount of shell money. If this offer is accepted, they *exchange moneys*, not necessarily in equal amounts, and perfect friendship is restored."

An able and impartial historian, Mr. J. P. Dunn, gives a closely similar account of the Navajos.[1] One characteristic of this people, he tells us, "is their form of government, or rather their lack of government. When they came under our control they numbered about 12,000, of whom 2,500 were warriors; but, notwithstanding their numbers, and the extent of country they occupied, they had scarcely any central controlling power, and what power there was, was on a democratic basis. No particular form of government obtained among them, a man having as absolute control over his children while they lived with him as of his slaves; but once a warrior, a man was his own master, and once married, a woman was largely her own mistress. Head-chiefs were made and unmade with little ceremony, and the pledges of a head-chief appeared to have little weight, either while he was in office or afterwards. On account of this lack of executive power, there was no enforcement of law, and little law to enforce. Religious scruples were the chief restraining power." "Major Backus," we are told, "once asked a Navajo chief how they punished their people for theft. 'Not at all,' he replied. 'If I attempt to whip a poor man who has stolen my property, he will defend himself with his arrows and will rob me again. If I leave him alone, he will only take what he requires for the time.'"

It is a point of much interest to ascertain in what degree a people of these peculiar characteristics, differing so widely in certain respects from most American tribes—brave and independent, but neither cruel nor revengeful,—intelligent, ingenious, industrious, eager for acquiring property, yet with no law but usage, and no means of enforcing this usage beyond the influence of public opinion and of their own religion—have thriven in the agitated world of Western America, where lawless force or forceful law alternately dominate all other communities. This result we learn from the latest and best authority, the Reports of the U. S. Commissioner for Indian Affairs.

In 1889 the tribe was computed by the local agent to number some 21,000 souls, or about the twelfth part of all the Indians in the United States, exclusive of Alaska. Twenty years earlier their number was computed at only 13,000, showing a remarkable increase. That this increase was natural, and not due to accessions from other tribes, is made evident by the "vital statistics," which return for the previous year 1,400 births to 700 deaths. Their vast reservation of 3,500 square miles—as large as some European kingdoms—is spread over a mountain region elevated six thousand feet above the sea, and "for picturesque grandeur not to be excelled in the United States." But of their more than two millions of acres, only some sixty thousand could be cultivated, and those only by artificial irrigation. The Indians, however, had managed to till about eight thousand acres, on which they raised good crops of wheat, maize, potatoes, melons, onions, and other vegetables. But the mountains afford abundant pasturage, and the wealth of the people is in their "stock." They owned in 1889 the immense number of 250,000 horses, 700,000 sheep, and 200,000 goats. "By common consent," the agent writes, "the sheep are considered the property of the women, and are clipped in the spring and fall of each year." The wool crop of the previous year had exceeded two millions of pounds, most of which, after reserving the needed supply for wearing, they had sold to the white

[1] "Massacres of the Mountains: a History of the Indian Wars of the Far West." By J. P. Dunn, jr. (1886); p. 254.

traders in the neighbourhood. The four thousand matrons of this industrious tribe must be among the wealthiest women in America. So well-disposed are the people that the agent had no serious offences of any kind to report. In this large territory, filled with a property of a kind most tempting to Indian cupidity, a small band of twenty-five native policemen had been ample for maintaining order. "Heretofore," the agent reports, "it had been the custom to have a white man for chief of police, but I allowed the force to select one of their own number, and the result has been better satisfaction and greater efficiency." "The Indians and the white settlers on the outside of the reservation," we are further told, "are on good terms, and apparently cultivate friendly relations." Their own disputes are usually "settled among themselves." Their nominal chiefs have hardly any influence; their advice is seldom sought, and when offered is rarely accepted. In cases of difficulty, "the matter is generally laid before the agent, whose decision and advice are accepted in good faith." The only troubles which the agent had encountered in this modern Utopia, during his five months' tenure of office, had arisen from the inclination of the people for gambling. On this subject he reports that "when a crowd of them met at the agency, it was the custom to spread a blanket anywhere and indulge their favorite proclivity. This," he adds, "led to petty thieving in several cases, which I promptly punished, and broke up the indulgence in this locality." After mentioning some trouble between the Navajos and the neighbouring Moquis, caused by horse-stealing, which was settled in a council of the tribes, and a single case of homicide in self-defence, he remarks: "This is the sum total of sins of commission among 21,000 ignorant and uncivilized American Indians, as reported to me in a little over five months,—and the Navajos invariably report the wrong-doings of their neighbours." To this statement this clear-headed and benevolent agent, Mr. Vandever, adds the natural inquiry: "Can any community of like numbers in the civilized world make so good a showing?" It should be mentioned, as an evidence that the virtues as well as the accomplishments of the Navajos are mainly of home growth, that there had been no missionaries among them, and that only about a hundred of them knew "enough of English for ordinary intercourse."

Something should be said of that other branch of the southern Tinneh, the Apaches, who have until recently borne such a formidable reputation. In the opinion of careful inquirers, this reputation, if naturally earned, has not been properly deserved. As is well known, the early Spanish settlers brought with them the conquering and grasping mood which then prevailed in their mother country, and which allowed in the native tribes no other choice than that between absolute subjection and perpetual hostility. The Apaches, safe in their fastnesses of desert and mountain, quick-witted and resolute, refused to submit, and were compelled to fight. Two centuries of this exasperating warfare bred in them an embittered temper, not natural to their race. Some years elapsed after the transfer of their country from Mexican to Anglo-American rule before they were made to understand that their new neighbors desired neither to enslave nor to exterminate them. As this conviction grew, a marked change has appeared in their disposition and conduct. Those who have been gathered on reservations and well treated begin to show the natural qualities of their stock. In 1889, the Apaches on the Mescalero reservation in New Mexico numbered 474. The agent, Mr. Bennett, reports of them:—"Their general behaviour and conduct have been most excellent, not a crime having been committed by them during the year either against whites or Indians, and not a case of

drunkenness nor a quarrel of any kind among them since I assumed charge. Very many are quite skilfully cultivating their little farms, and many more would be doing so were they supplied with teams and implements." "Since assuming charge of the agency," he continues, "I have re-organized our police force of eleven men, and find them obedient, cheerful in the performance of their duties, and always ready and willing to execute all commands given to them. They are kept almost constantly on the move, always on duty, visiting the various outlying camps, and herding beeves. They take good care of their uniforms, arms, horses and accoutrements, and are proud of the distinction conferred upon them."

The Government has established a boarding-school on the reservation. This school, the agent remarks, was temporarily "closed in May last, by reason of the resignation of the superintendent, since which time the boys have been doing most excellent work on the school farm, of which they are justly proud. As the result of their labour they will supply the school through the winter with an abundance of vegetables, and their cows and calves with hay, corn, and oats. The six girls, though young, are making good progress in housekeeping, cooking, needlework, etc., and are bright, intelligent, and lady-like in their deportment."

There seems something almost pathetic in this description, when we recall to mind that these industrious and well-conducted farmers, these docile and faithful policemen, and these zealous boy-pupils and "bright and lady-like girls," belong to that direful brood of ferocious and untamable Apaches, against whose utter extermination hardly a voice was raised, some twenty years ago, on either side of the Anglo-Mexican boundary, except here and there perhaps in the mild remonstrance of some "visionary" philanthropist.

But the ethnologist, who really understands the science which he professes to pursue, has no reason to be surprised at any progress which the Navajos, or their congeners have made or may hereafter make. Any one who will take the trouble to study in M. Petitot's work the language of their original stock will be satisfied that none but a people possessing powers of observation, reflection, and discrimination in a very high degree, could have spoken such a language. The remark of Prof. Max Müller concerning the language of the Iroquois (which he learned from an Oxford student of that race), that the people who fashioned such a speech must have been "powerful reasoners and accurate classifiers,"[1] will apply with even greater force to the speakers of the Tinneh idiom. If we accept the rule proposed by my able and learned friend, Dr. Brinton, in his work on "The American Race,"[2] that "the final decision as to the abilities of a race or an individual must be based on actual accomplished results, not on supposed endowments," —qualifying this rule merely by a just regard to the circumstances under which the results are achieved,—we may fairly ask where among all the races of the earth shall we find a community which in the course of so brief a term as five or six hundred years—to which, according to the facts at present known to us, the residence of the northern Tinneh in their present abodes has been limited,—has, with such slight foreign assistance, achieved such remarkable results A few hundreds of ignorant and poverty-stricken emigrants from the far north have developed into a wealthy commonwealth, maintaining

[1] From a letter quoted in my "Iroquois Book of Rites," p. 98.

[2] See p. 42 of that work.

a prosperous and peaceful independence, winning the respect and goodwill of its neighbours, both civilized and savage, developing a high degree of ingenuity in some of the most delicate and difficult mechanical arts, and producing poetical compositions fit to rank with or above the most notable productions of the founders of civilization—the Assyrians and Egyptians. Such, it is believed, is a fair statement of the results on which, in this case, the students of linguistic ethnology may found a just claim in favour of the methods and principles of their science.

We now turn to another part of the globe, and to a very different race and language, both of which will afford some highly instructive lessons. By the common consent of those ethnologists who do not base their science upon linguistic tests, the Australians are ranked among the lowest, if not as the very lowest, of the races of men. In the time of that pre-scientific anthropology which prevailed half a century ago, when the various human races, as well as the various species of animals, were supposed to have somehow come into being in the regions which they inhabited, the Australians, dwelling in a continental island of a past geological era and amid animals of the most primitive mammalian forms, were held to belong to a distinct human species, as primitive and as imperfect as its surroundings. The Darwinian system swept away this fanciful notion; but, ill understood by some of its votaries, it has given rise to another fancy hardly less opposed to the principles of true science. The Australians have been accepted by some distinguished members of this school (though not by Darwin himself) as the best surviving representatives of the earliest men of the present human species. Their reasoning may be stated succinctly in a syllogistic form, as follows. The earliest men of the existing species must be supposed to have been the lowest of men in intellectual capacity and in social condition. The Australian aborigines are now the lowest of men in intellect and in social condition. They must therefore be deemed to represent more nearly than any other race the character and social condition of the earliest men.

Both premises assumed in this reasoning are mere assumptions, which are not only not based upon facts, but are opposed to the clearest indications derived from the actual data we possess. There is no better reason for supposing the earliest men of the present species to have been low in intellectual capacity than there is to suppose them to have been small in stature and physically weak. The men who combated and overcame the monsters of the quaternary era, the mammoth, the cave-bear, and the cave-lion, and whose earliest historical offspring reared the vast architectural piles of Egypt and Assyria, must have been as vigorous in mind as in body. As for their supposed modern representatives, the Australians, it is astonishing that highly educated men, professors of philosophy, who undertake to treat of the intellect of a race, should refuse to consider that prime and incomparable exponent of intellect, the language. Whether we accept the view of Max Müller and the high authorities whom he cites on his side—that speech and reason are identical (or rather, like heat and motion, are different manifestations of the same force)[1]—or whether we retain the more common opinion that speech is the expression of thought—in either case the language of a people ought to be the first evidence to which we should resort in judging of its intellectual endowment. We may now briefly consider this invaluable evidence, and some very curious and unexpected conclusions to which it leads.

[1] "The Science of Thought," chap. i.

The earliest attempt to explain the complex system of Australian speech was made by a zealous and experienced missionary, the Rev. L. E. Threlkeld, of New South Wales. His work, a pamphlet of some 130 pages, entitled "An Australian Grammar, comprehending the principles and natural rules of the language, as spoken by the aborigines in the vicinity of Hunter's River and Lake Macquarie, in New South Wales," was published at Sidney in 1834. The author had been previously a missionary in the Society Islands, and had acquired a knowledge of the language there spoken; but while the Tahitian alphabet was found nearly sufficient in his new field, the simple Polynesian grammar afforded him no aid in unravelling the difficult web of the Australian speech. A few years after his grammar was published I had the pleasure of visiting him at his mission, and witnessing his assiduous efforts for the benefit of his humble charges. His manuscripts, which he freely communicated to me, showed his constant progress in his studies of the language, of which he had found it as hard to fathom all the depths as his successors have found it to discover all the mysteries of the social organization of this singular people.

The pronunciation of the language is simple and euphonious. The consonants *s*, *f*, and *v* are lacking. The only sound strange to English utterance is the ñ (*ng* as in *singer*) when it is an initial, as *ñato'a*, I; *ñinto'a*, thou. The vowels are sounded as in Italian or German, except the *ŭ*, which represents the English *u* in *but*.

There are seven declensions, two of which are restricted to proper names, the one of persons, the other of places. The remaining five declensions comprise the common nouns, and are distinguished by the terminations of the nominative. Each declension has ten or eleven cases, comprising two nominatives, a genitive, two datives, an accusative, and four or five ablatives. It would be easy to furnish a special name for each case, but for our purpose it is needless. The fact which chiefly calls for remark is that the language discriminates in its cases with more logical nicety than any of the Aryan tongues. In the nominative, for example, there is a neuter or ground form, used in answer to the question, who (or what) is it?—and an active form which governs the verb, and answers the question, who (or what) did it? There is a dative expressing "for" the object, and another expressing "to" the object; and the various ablatives express "on account of," "from," "along with," "staying with," etc. The character of these declensions can be most clearly shown by giving examples of the first and second. In the first, *Biraban*, which means "Eagle-hawk," is declined as a proper name, and in the second as a common noun.

	First Declension.		Second Declension.	
Simple nom.	*Biraban*,	Biraban	*biraban*,	a hawk
Active nom.	*Birabanto*,	B. does, did, will, etc.	*birabanto*,	a hawk does, etc.
Genitive	*Birabanumba*,	Biraban's	*birabankoba*,	a hawk's
1st dat.	*Birabannuñ*,	for B.	*birabanko*,	for a hawk
2d dat.	*Birabankinko*,	to, toward B.	*birabantako*,	to a hawk
Accusative	*Birabannŭñ*,	Biraban	*biraban*,	a hawk
1st abl.	*Birabankai*,	on account of B.	*birabantin*,	on account of a hawk
2d abl.	*Birabankabiruñ*,	away from B.	*birabantabirŭñ*,	away from a hawk
3d abl.	*Birabankatoa*,	along with B.	*birabantoa*,	along with a hawk
4th abl.	*Birabankinbo*,	staying with B.	*birabantaba*,	staying with a hawk

It will be evident at a glance that these declensions are formed by affixing to the

nouns certain particles of the class which we call prepositions, but which would here be more accurately styled postpositions. In this manner, as is well known, scholars suppose that the Aryan cases were originally formed. There seems no particular reason for holding that the closer union of the Aryan affixes to their nouns is evidence of a higher degree of intellect or culture in those who utter them; but if any person of Aryan descent chooses to gratify his pride of race by maintaining such an opinion, it would be idle to seek to disabuse him. The main point to be considered is the clearness of expression which these varied affixes must give to a sentence in linking the nouns and pronouns (which are also fully declined) to the other parts of speech.

The verbs have not the variety of "classes" which are found in the Tinneh and many other American languages; nor have they inflections for person and number, which are always expressed by separate pronouns. In this respect, as in some others, the language is highly "analytic." But the forms of tenses and moods are very numerous. The root or ground-form of the verb is usually a word of one or two syllables, and to this ground-form various particles are appended, which modify the signification, and sometimes protract the word to a considerable length. The following are only a few specimens, derived from the conjugation of the verbal root *bu* or *bun*, to strike. (The nominative pronoun *ban*, I, is understood.)

Moods or Forms.

Active transitive form,	*buntan*,	I strike.
Definite, or participial,	*bunkilin*,	I am striking.
Continuative,	*bunkililin*,	I am continually striking (as threshing, beating, etc.).
Reflective,	*bunkileŭn*,	I struck myself.
Reciprocal,	*bunkilan*,	we strike one another.
Optative,	*buwil*,	I would strike, or, that I might strike.
Deprecatory,	*buntea kŭn kon*,	lest I should strike.
Imperative,	*buwa*,	strike.
Infinitive,	*bunkiliko*,	in order to strike.

Tenses.

Present,	*buntan*,	I strike.
Remote past,	*buntala*,	I struck formerly.
Recent past,	*bunkŭla*,	I struck lately.
Recent pluperfect,	*bunkŭla-ta*,	I had lately struck.
Hodiernal past,	*bunkeŭn*,	I struck this morning, or to-day.
Future aorist,	*bunŭn*,	I shall strike.
Crastinal future,	*bunkin*,	I shall strike to-morrow.
Inceptive future,	*bunkili-kolañ*,	I am going to strike.

There are several forms of the simple substantive verb, the most usual being *ka*, a root which signifies "being or existence, in time, place, or state." It is used apparently in all respects like the Latin *esse* or the English *be*, and is conjugated throughout all the forms and tenses. The participle is *kan*, being, as "I being afraid," *kinta kan ban*, lit., afraid being I. The preterite is *kakŭla*; as *bŭka ban kakŭla*, I was angry (angry I was). Imperative, *kauwa*, be; as *korŭn kauwa*, be still (quiet be). It is also used as an auxiliary with other verbs.

Verbs have, as in Latin, four conjugations,—using this term, as in that language, to signify different modes of inflecting verbs. As in Latin, also, they are distinguished by the termination of the infinitive. Verbs of the

1st conjugation	end in	*ŭliko*, *oliko* and *eliko*.
2nd	"	"	*kiliko*.
3rd	"	"	*biliko*.
4th	"	"	*riliko* and *tiliko*.

These conjugations differ in the formation of the tenses as follows :—

	Present.	Remote past.	Recent past.	Future.	Participle.	Infinitive.
1.	*an*	*ala*	*a*	*ŭnŭn*	*ŭlin*	*ŭliko*
	an	*ala*	*a*	*ŭnŭn*	*olin*	*oliko*
	an	*ala*	*a*	*ŭnŭn*	*elin*	*eliko*
2.	*tan*	*tala*	*kŭla*	*nŭn*	*kilin*	*kiliko*
3.	*bin*	*biala*	*bia*	*binŭn*	*bilin*	*biliko*
4.	*rin*	*rala*	*rea*	*rinŭn*	*rilin*	*riliko*

There are many verbs which are combined with other verbs and with adjectives to vary their meaning. Thus, *mŭnbili*, to permit, added to the root *bu*, to strike, forms *bumŭnbili*, to permit to strike. *Mali*, to make or do, gives a causal signification, as *kola*, secret, *kolamali*, to conceal; *tiir*, broken, *tiirmali*, to break. *Kŭli*, signifies spontaneous action, as *tiirkŭli*, to break of itself. *Bŭli*, signifying "to be in any act," forms active verbs, as *teti*, dead, *tetibŭli*, to be dying. *Mainŭli*, or *maina*, gives to the preceding verb the meaning of failure or incomplete operation, as *na*, to see, *namainŭli*, to look without observing, *ñŭrŭ*, to hear, *ñŭrŭmainŭli*, to hear but not to attend. *Bu*, to strike, *bumaina bon ban*, I nearly struck him, or did not quite strike him; lit., "to strike failed him I."

But perhaps the most notable excellence of this language is found in its verbal nouns, or nouns derived from verbs, by the aid of various inflections or affixes, which enable the speaker at once to give an intelligible name to any object, act, or quality. The modern English and the modern Romanic tongues—mere "jargons" which arose out of the conquests and convulsions of the dark ages,—have lost in a large measure that happy Aryan facility of word-formation which was possessed by the Greek and Sanscrit, and to a less degree by the Latin, and which is still retained by the German. This useful facility is enjoyed in the highest degree by the languages of eastern Australia. The following table of derivatives does not appear in Mr. Threlkeld's grammar, but was prepared by him at a later date, and was copied by me from his manuscript. It shows in a striking light the advantages which the language derives from this source, both for discriminating nice shades of meaning, and for devising names descriptive of new objects. It also displays, both in the language and in the people, a remarkable aptitude for expressing abstract ideas.

Table of Australian Derivatives.

	1. The Verb.		2. The Agent.		3. The Actor.		4. The Instrument.	
1.	*bunkili,*	to smite	*bunkilikan,*	smiter	*bunkiye,*	boxer	*bunkilikane,*	cudgel
2.	*uwali,*	to walk	*uwalikan,*	walker	*uwaliye,*	wanderer	*uwalikane,*	coach
3.	*mankili,*	to take	*mankilikan,*	taker	*mankiye,*	thief	*mankilikane,*	trap
4.	*umali,*	to do	*umalikane,*	maker	*umaiye,*	artisan	*umalikane,*	tool
5.	*wiyali,*	to speak	*wiyalikane,*	speaker	*wiyaiye,*	commander	*wiyalikane,*	book
6.	*yalawali,*	to sit	*yalawalikan,*	sitter	*yalawaiye,*	idler	*yalawalikane,*	seat
7.	*ñŭrali,*	to hear	*ñŭralikan,*	hearer	*ñŭraiye,*	listener	*ñŭralikane,*	ear-trumpet
8.	*ñukili,*	to give	*ñukilikan,*	giver	*ñukiye,*	almoner	*ñukilikane,*	shop
9.	*kŭrili,*	to carry	*kŭrilikan,*	carrier	*kŭriye,*	porter	*kŭrilikane,*	yoke
10.	*ñolomali,*	to protect	*ñolomalikan,*	protector	*ñolomaiye,*	saviour	*ñolomalikane,*	safeguard
11.	*pirikili,*	to recline	*pirikilikan,*	recliner	*pirikiye,*	sluggard	*pirikilikane,*	couch
12.	*tiwali,*	to seek	*tiwalikan,*	seeker	*tiwaliye,*	searcher	*tiwalikane,*	drag
13.	*wunkili,*	to leave	*wunkilikan,*	leaver	*wunkiye,*	magistrate	*wunkilikane,*	watch-house
14.	*upali,*	to perform	*upalikane,*	performer	*upaiye,*	writer	*upalikane,*	pen

Table of Australian Derivatives (*continued*).

	5. The Deed.		6. The Action.		7. The Place.	
1.	*bunkilito,*	blow	*bunkilita,*	smiting	*bunkiliñeil,*	pugilistic ring
2.	*uwalito,*	journey	*uwalita,*	walking	*uwaliñeil,*	parade-ground
3.	*mankilito,*	grasp	*mankilita,*	taking	*mankiliñeil,*	a bank
4.	*umalito,*	work	*umalita,*	working	*umaliñeil,*	manufactory
5.	*wiyalito,*	speech	*wiyalita,*	speaking	*wiyaliñeil,*	pulpit
6.	*yalawalito,*	session	*yalawalita,*	sitting	*yalawaliñeil,*	pew
7.	*ñŭralito,*	attention	*ñŭralita,*	hearing	*ñŭraliñeil,*	town (for news)
8.	*ñukilito,*	liberality	*ñukilita,*	giving	*ñukiliñeil,*	market
9.	*kŭrilito,*	carriage	*kŭrilita,*	carrying	*kŭriliñeil,*	wharf
10.	*ñolomalito,*	protection	*ñolomalita,*	protecting	*ñolomaliñeil,*	fortress
11.	*pirikilito,*	rest	*pirikilita,*	reclining	*pirikiliñeil,*	bed-room
12.	*tiwalito,*	search	*tiwalita,*	seeking	*tiwaliñeil,*	the woods
13.	*wunkilito,*	resignation	*wunkilita,*	resigning	*wunkiliñeil,*	watch-house
14.	*upalito,*	performance	*upalita,*	performing	*upaliñeil,*	a desk

Mr. Threlkeld's notes explained that a musket (as well as a cudgel) is called *bunkilikane*, because it strikes with the ball; and the same word is applied to a hammer or mallet. A magistrate is called *wunkiye*, when he resigns or commits an accused person to a jailer; and hence a watch-house or jail is called either *wunkilikane*, a means of committing, or *wunkiliñeil*, a committing-place. *Upali* signifies, properly, to do anything with an instrument; hence *upaiye* might be applied to a painter or cobbler, as well as to a writer, and *upalikane* would then mean a brush or awl. To the foregoing list might have been added a column of very expressive derivatives ending in *toara*, and having a passive signification, as *buntoara*, that which is struck (as a drum or a bell), and *umalitoara*, that which is made or done, as any piece of work.

It is now ascertained that all the tribes of Australia speak "dialect-languages" belonging to one stock. This fact I was able to determine for those of the eastern portion by vocabularies collected during my visit. At a later day my distinguished friend, Dr. Friedrich Müller, of the Novara expedition, had opportunities of extending his observations and collections over all the coasts, with the same result. A grammatical sketch kindly furnished to me by a well-informed missionary, the Rev. William Watson, of

Wellington valley, two hundred miles west of Mr. Threlkeld's station, showed that the construction of the language remained substantially the same, but the forms were, in general, fewer and less complex. Several cases of nouns had been lost, and the verbal derivatives were less numerous. According to Dr. Müller, this grammatical decay continues to the west coast, where the languages, though retaining the pronouns and other words indicating their original affinity, have become in a large degree formless. This fact will be found significant as we proceed.

It becomes a matter of great interest to determine the true character and the ethnological affinities of the people speaking this remarkable group of languages. The first observation to be made is that there is something enigmatical, at the first view, both in their physical appearance and in their intellectual manifestations. The former, as described in my notes made on the spot, combines the peculiarities which anthropologists have been accustomed to ascribe to totally distinct races:[1] "They are of middle height, with forms fairly well proportioned. The cast of the face is a medium between the African and the Malay types. The forehead is narrow, sometimes retreating, but often high and prominent; the eyes are small, black, and deep-set; the nose is much depressed at the upper part between the eyes, and widened at the base, but, with this, it frequently has an aquiline outline. The cheekbones are prominent. The mouth is large, with thick lips and strong well-set teeth. The jaws project, but the chin is frequently retracted. The head, which is very large, with a skull of unusual thickness, is placed upon a short and small neck. Their colour is a dark chocolate, or reddish black, like that of the Guinea negro, but varying in shade so much that individuals of pure blood are sometimes as light-coloured as mulattoes. That which distinguishes them most decidedly from other dark-skinned races is their hair, *which is neither woolly*, like that of the Africans and Melanesians, nor frizzled like that of the Feejeans, nor coarse, stiff, and curling, as with the Malays. *It is long, fine, and wavy, like that of Europeans.*[2] When neglected, it is apt, of course, to become bushy and matted, but when proper care is taken of it, it appears as we have described. It is sometimes of a glossy black, but the most common hue is a deep brown. Most of the men have thick beards, and their skins are more hairy than those of whites."

The like perplexing contradictions appeared in their intellectual and moral traits. The same notes state the opinion then formed,—that "it is doubtful what grade of intellectual capacity is to be ascribed to this people." While, on the one hand, "the impression produced on the mind of a stranger by an intercourse with the aborigines in their natural state is that of great mental obtuseness, or, in plain terms, an almost brutal stupidity," it is noted that "several who have been taken from the forest when young,

[1] U. S. Exploring Expedition, vol. 7: "Ethnology and Philology," p. 107.

[2] I have italicized some words, not merely to draw attention to the important fact mentioned, but also to correct an unaccountable error of my learned friend, Dr. Gerland, who in his continuation of Waitz's great work (*Anthropologie der Naturvölker*) quotes from my volume, with some abridgment, the foregoing description of the Australian people, generally in a correct manner, but making me say of the hair, "it is long, fine and *woolly!*" Dr. F. Müller, naturally startled by this extraordinary statement (which would be much like a description of the Eskimo as having black skins), has in his *Allgemeine Ethnographie* (2nd edit., p. 205) devoted a long footnote to the correction of my supposed error. He evidently had not at the time seen my volume, which was thus strangely misquoted, and of which in his later master-work, the "*Grundriss der Sprachwissenschaft*," he has made considerable and always accurate use.

and have received instruction, have shown a readiness in acquiring knowledge and a quickness of apprehension which have surprised their teachers." In particular, their aptitude for learning languages and for music surpassed that of most white children. Their moral qualities had many singularities, but few of a repulsive character. To the whites, whom they regarded with a mixture of distrust and contempt, they seemed sullen, suspicious, and inordinately proud. Nothing would induce them to acknowledge any human being (of their own age) their superior, or show any mark of deference. Among their own people they were trained to exhibit a profound respect for age; and in their warfare, or rather their tribal quarrels, they were never bloodthirsty or implacable. Their contests were not conducted by treacherous surprises and massacres, but always with fair warning. The death of a single combatant usually ended a battle; after which followed a scene of recrimination, abuse, and explanation. "All hostility was then at an end, and the two parties mixed amicably together, buried the dead, and joined in a general dance."

Since this account was written many able investigators—missionaries and ethnologists—have made careful studies of this singular people, and the results have explained much that then seemed difficult to understand. It has become clear that if they are low in culture, they had yet in fact attained the utmost elevation which was possible in their surroundings. The nature of their country, the scantiness of food, and the frequent droughts, which compelled them to scatter over an immense surface and kept them constantly on the move, made all settled habits, and consequently all progress, impossible. The wisest of Aryan or Semitic communities, cast without resources into the interior of an almost barren continent, and compelled to subsist on wandering game, on roots and vermin, would speedily be pressed down by an iron necessity to the same level as that of these Australians. It may be doubted whether there are many communities which would have resorted to the same ingenious devices to mitigate the hardships of their lot, and preserve the amenities and safeguards of social life. It has been ascertained that nearly the whole of Australia, from shore to shore, was covered by a network of social regulations most happily devised for maintaining order and promoting friendly intercourse. Where all families were equally poor and equally independent, there could be no distinction or control either from rank or from wealth. The framers of their polity, therefore, fell back upon the natural and primal distinctions of age and sex. The elders were in all cases to rule, and the younger implicitly to obey. The intercourse of men and women was to be guarded by the most stringent rules, protecting woman from the violence of youthful passion or brutal strength, and placing her under the guardianship of her whole people, and more especially of a certain class of the people who were bound by ties of family or clanship to protect her. The common opinion that wives are captured by violence among the Australians is an exploded error. On the contrary, there are few races among whom the regulations respecting marriages are more strict or their violation more rigorously punished. The system of "marriage-classes" and totemic clans, moreover, extending throughout almost the entire island, is a sort of social freemasonry, or artificial relationship, furnishing to every Australian of any tribe cousins or colleagues in every other tribe, who are bound to receive and protect him. It is the opinion of Mr. A. W. Howitt, who is the highest authority on this subject, that this ingenious and useful

system is a work of legislation which has been deliberately devised and perfected for the general welfare by the Australian law-makers, through a series of generations.[1]

We have now to consider a point of great importance. As it is certain that the Australian stock was derived from some other region, ethnologists have naturally been led to seek for the mother country of this interesting people. The search has been successful, but the surprise to the seekers has been great, and the result to some of them not a little distasteful, as upsetting many cherished theories about "primitive man." The Australians are found to belong to the Dravidian family, which, prior to the Aryan invasion, occupied nearly the whole of Hindostan, and which still holds the southern portion of the peninsula, in some ten or twelve nations or tribes, speaking closely allied languages, Tamil, Telugu, Malayalam, Kanarese, Tula, Kudagu, Toda, etc., and numbering altogether nearly fifty millions of people.[2] It is, therefore, one of the most important of the great linguistic families of the globe. The character of the speakers of these languages ranks high. On this point there can be no better witness than Sir Monier Williams, the eminent Sanskrit scholar, who, in a recent work, thus describes them:

"Of the Dravidians the Telugu and Tamil speakers are by far the majority, each numbering fifteen or sixteen millions. The Tamil race, who occupy the extreme south from Madras to Cape Comorin, are active, hard-working, industrious, and independent. Their difficult and highly accentuated language reflects their character, and possesses quite a distinct literature of its own. The Telugu people, inhabiting the Northern Circars and the Nizam's territory, are also remarkable for their industry; and their soft language, abounding in vowels, is the Italian of the East. The Kanarese of Mysore resemble the Telugu race in language and character, just as the Malayalams of the Malabar Coast resemble the Tamils. I noticed that the sea-faring Tamils of the southern coast are much more able-bodied than the ordinary Hindus. Numbers of them migrate to Ceylon, and at least half a million form a permanent part of the population of that island. They are to be found in all the coffee plantations, and work much harder than the Sinhalese. Indeed, all the races of South India seem to me to show readiness and aptitude for any work they are required to do, as well as patience, endurance, and perseverance in the discharge of the most irksome duties." "As servants, they are faithful, honest, and devoted, and will attach themselves with far greater affection than English servants to those who treat them well. They show greater respect for animal life than Europeans. They have more natural courtesy of manner, more filial dutifulness, more veneration for rank, age, and learning, and they are certainly more temperate in eating and drinking."[3]

Some of these qualities, especially independence, filial affection, and respect for age, reappear as well-known characteristics of the Australians, whom the Dravidians also recall in their dark skins and their long and wavy hair.

The immense influence of the Dravidian race in Indian history has been too little regarded. When the Aryans, about fifteen hundred years before the Christian era (as is commonly held), entered northwestern Hindostan and began their conquest of the country, they were a race of barbarous herdsmen, but little higher in culture than the Zulus and Bechuanas of South Africa. The researches of Hehn, Schrader, and other careful German

[1] Journal of the British Anthropological Institute for August, 1888, p. 66.

[2] "The Modern Languages of the East Indies." By Robert N. Cust, p. 66.

[3] "Modern India and Indians." By Monier Williams; 2d. edit., pp. 127-8.

archæologists, leave no question on this point.[1] They were a wandering race, depending mainly on their cattle and sheep for food and clothing, ignorant of the smelting of metals, living in circular huts of wattle and straw, excessively superstitious, domineering, and cruel, and consumed with the land-hunger which possesses all pastoral races. That they were a people of strong intellectual powers is evident from their language. The Sanskrit, with all its defects, which are neither few nor small, could have been spoken only by a highly gifted race. That they were brave and resolute is also apparent from their history. It is equally evident from this history, as it may be gathered from the Rig-veda, that they encountered hardly less resolute opponents.[2] Centuries passed in the desperate conflict before the northern invaders had made their way from the Indus to the Lower Ganges. During this time vast numbers of the conquered people had been incorporated with the conquering race, either as an inferior caste, or as wives and servants in the families of the ruling classes.[3] It seems highly probable that the mass of the people of North India, while adopting some form of Aryan speech, remained in great part of Dravidian blood. Such was the opinion of Latham.[4] What is of more importance is the evidence from many sources that at the time of the conquest the Dravidians were more enlightened than their conquerors. They were a race of industrious cultivators, mechanics, and mariners. The rude Aryan cattle-herders learned from them the habits of settled and civilized life, and the mingled races entered upon a career of splendid achievements in arts and literature which neither of them could have compassed alone.

The Dravidian languages themselves, though certainly inferior in some respects to the Aryan, do not lack their peculiar excellences, as Sir M. Williams has pointed out. A striking piece of evidence may be quoted from another high authority. Prof. Whitney writes of these languages: "The Dravidian tongues have some peculiar phonetic elements, are richly polysyllabic, of general agglutinative structure, *with prefixes only*, and very soft and harmonious in their utterance. They are of a very high type of agglutination, like the Finnish and Hungarian; and the author has been informed by an American who was born in Southern India and grew up to speak its language vernacularly along with his English, a man of high education and unusual gifts as a preacher and writer, that he esteemed the Tamil a finer language to think and speak in than any European tongue known to him."[5]

Thus the Australians, whom some too eager theorists have accepted as the best repre-

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[1] See especially Schrader's "Sprachvergleichung and Urgeschichte," the second edition, admirably translated (with the author's additions), by F. B. Jevons, under the more appropriate title of 'Prehistoric Antiquities of the Aryan Peoples."

[2] "Jevons's Schrader," p. 111.

[3] "Jevons's Schrader," p. 112. De Quatrefages, "Les Pygmées," p. 84.

[4] See his "Natural History of the Varieties of Man," p. 545.

[5] "The Life and Growth of Language," p. 244. The expression "with *prefixes* only" is doubtless a misprint. The Dravidian languages, like the Australian, are varied entirely by suffixed particles or terminational inflections. These, it may be added, are sometimes identical, or nearly so, in the two groups of languages. Thus, in the Dravidian Tulu, we have from *mara*, tree, the dative *maroku*, and from *naramani*, man, *naramanigu;* while in the Lake Macquarie and Wiradhurei dialects of the Australian we have from *biraban*, hawk, the dative *birabanko*, and from *bagai*, shell, *bagaigu*. So the plural suffix in Tamil is *gal*, and in Wiradhurei *galan*, to which in each language the case particle is added. In Tamil, *maram*, tree, has for its nominative plural *marangal*, and for its dative *marangalukku;* while in Wiradhurei, *bagai*, shell, makes in the nominative plural *bagaigalan*, and in the dative *bagaigalangu*. So closely do those widely separated languages accord, even in minute grammatical points.

sentatives of primeval man, prove to be the offspring of one of the most highly endowed races of Southern Asia. Their present low condition—in which, however, the degradation is more apparent than real—is simply the result of hard surroundings, against which, in their situation, the greatest force of intellect could not successfully contend. Their history has exactly reversed that of the Tinneh tribes. The latter, a naturally intelligent race, depressed to seeming stupidity in the frozen north, develop speedily in the sunny and fertile south into the quick-witted Hupas and Navajos. The intelligent and versatile Dravidian emigrants, scattered over the sterile plains of Australia, without domestic animals and with no plants fit for cultivation, sink into a mental torpor almost though not quite as deep as that of the northern Tinneh. In both cases the intellectual faculties, though held in restraint by the harsh environment, remain merely torpid and not seriously weakened, as is shown by the clear evidence of the languages which they speak, and by the remarkable proficiency evinced by some of their children at school, as already noted.[1]

There is, as has been stated, good reason for supposing that the Southern Tinneh have not occupied their present abodes much more than seven hundred years, and some of them not more than five hundred years. It would be a matter of interest to determine, if possible, how long the Dravidian colonists have occupied Australia. There is always a disposition to imagine that the so-called aborigines who are found inhabiting any territory have possessed it from a very remote period. Less than fifty years ago the Polynesian islanders were supposed by some ethnologists of high rank, including an authority no less distinguished than Broca, to be the remnants of the population of a vast continent, which in some former geological era had sunk beneath the waters of the Pacific, leaving only its mountain tops and loftier plateaux, from Hawaii to New Zealand, to be the refuges of the few survivors of its population. It is now admitted on all hands, through the ample proofs furnished by tradition and language, that the islanders are the offspring of comparatively recent emigrations from the Malaisian archipelago, the earliest arrival from that quarter dating not much more than two thousand years back; and several of the islands, notably New Zealand and Easter Island, having been peopled within the last five hundred years.[2]

Not much, perhaps, is to be learned from the legends of the wandering Australians. Yet their traditions seem to show that their ancestors entered the island by way of the Gulf of Carpentaria, and spread first southward along the eastern coast, and thence inland, along the rivers and across the arid plains, to the western coast. They found, it

[1] While the proof-sheets of this essay are under correction, *L'Anthropologie*, the valuable periodical of MM. Cartaillac, Hamy and Topinard, in its number for December, 1891, brings us an important piece of evidence, showing how promptly and strongly the natural intelligence of these members of the Dravidian stock manifests itself, with merely the advantages of good instruction and a settled life:—"There are few persons, even among those who deny all aptitude for intellectual progress to the black races, who are aware of the existence of a native settlement of Western Australians, called New Nursia, situated about seventy miles from the town of Perth, the capital of West Australia. This settlement, established in 1846 by two Spanish Benedictines, Fathers Serra and Salvado, comprises at present a convent, a church, a school, and a village of fifty cabins, occupied by native Christians, employed in agriculture and in various trades. One of the young girls educated in the settlement now holds an office in the postal and telegraph service of the West Australian Government. The boys develop well; they comprehend quickly what they are taught, and become good workmen, *as capable as the whites.*"

[2] See "Les Polynésiens et leurs Migrations," by A. de Quatrefages, and Peschel's "Races of Man," American edit., p. 349.

would seem, the country thinly occupied by a weak but cunning race of savages, who disappeared before them—doubtless in part exterminated and in part absorbed by the new population.[1] That these savages were of the negrito race, of whom a remnant survived in Tasmania, there can hardly be a doubt. How the Dravidian voyagers reached the Gulf of Carpentaria may be readily imagined. From the earliest times of which we have any knowledge, the pre-Aryan inhabitants of Hindostan, who were and still are bold navigators, were accustomed to visit the East Indian islands in considerable numbers. They were wont to limit their trading voyages to the nearer and more populous Malaisian islands.[2] But it may easily be understood that if any event, such as the Aryan invasion of India, had caused an unusually large emigration from that country, some of the more determined emigrants, seeking a new and scantily peopled region for settlement, might have pushed on eastward, through the straits dividing New Guinea from Australia, until they found a sufficiently inviting shelter in the harbours of the Carpentarian gulf.

The evidence of language seems to confirm this view. The similarity between the Dravidian and Australian languages, especially in their pronouns (which in some dialects of the two are almost identical), seems too great to allow us to suppose a longer separation of the two branches than that which has existed between the Asiatic and European Aryans. The fact that the entrance of the emigrants was, as Mr. Howitt sees reason to believe, by way of the northern gulf and down the eastern coast, seems to be shown by the circumstance that the languages of that coast retain most largely the complex Dravidian forms, which gradually lessen and become simpler as we go westward—precisely as the Polynesian grammar becomes simpler as we go farther from Malaisia, or as the grammar of the ancient Aryan languages is simplified as we advance from eastern to western Europe.

And here we return to a question of linguistics, which has been already noticed, but which requires, perhaps, a fuller discussion. When it was first discovered that the languages spoken by many barbarous tribes possessed a singular capacity for expression and a vast variety of forms for nicely discriminating the differences of objects and of ideas, an explanation was proposed which seemed plausible and was at first accepted by many reasoners. These elaborately constructed languages, it was suggested, indicated that the people who spoke them were the descendants of a more civilized race, and had simply retained their ancestral language while losing in other respects their ancestral culture. But further reflection and inquiry showed that this explanation could not be deemed satisfactory. If refinement of language is a product of culture, it was naturally asked, why should it not be lost with other like products? If conjugations and declensions, substantive verbs and abstract terms, are due to civilization, like the smelting of metals, the weaving of cloth, the architectural and pictorial arts, why should these linguistic achievements be retained when all the other gains of high cultivation have been

[1] A. W. Howitt, "Migrations of the Kurnai Ancestors," in the 'Journal of the British Anthropological Institute' for May, 1886, p. 411; A. L. P. Cameron, in same journal for May, 1885, p. 368.

[2] See the facts relating to the Telugu or Telinga people, cited by Prof. van Rhyn in his learned article on the "Races and Languages of India," in the 'American Encyclopædia,' vol. ix, p. 215. "They are good farmers, and many of them were formerly seafaring men, undertaking long voyages. They held at one time large islands in the Eastern Archipelago."

lost? How is it possible to suppose that the hundreds of barbarous tribes in America and Africa, while losing all other arts of an earlier civilization, have preserved solely this beautiful mechanism of a highly organized speech?

These considerations led to a change of opinion—a change which resulted in two directly opposite views of the problem and its proper solution. One of these was proposed by an eminent Franco-American scholar, who was the first to study the complex American languages with philosophical acuteness, and to exhibit in a clear light their peculiar characteristics. The other, which will be first considered, has in later years been maintained by many writers, but by none with more force and eloquence than have been displayed by a distinguished English author, whose works in other departments have been justly admired and have delighted thousands of readers. In reference to the subject now under consideration, he states that he had formerly held the view that the rich and artistic structure of the languages of some barbarous nations implies an intellectual power superior to what we now find in these nations, and that they therefore prove a condition previously exalted. "Further explanation," adds Dr. Farrar, "has entirely removed this belief."[1] He is now of opinion that "this apparent wealth of synonyms and grammatical forms is chiefly due to *the hopeless poverty of the power of abstraction*, and is "the work of minds incapable of all subtle analyses." He adds: "Many of these vaunted languages (*e.g.*, the American and Polynesian)—these languages which have countless forms of conjugation, and separate words for the minutest shades of specific meaning—these holophrastic languages, with their "jewels fourteen syllables long" to express the commonest and most familiar objects—so far from proving a once elevated condition of the people who speak them, have not even yet arrived at the very simple abstraction required to express the verb "to be," which Condillac assumed to be the earliest of invented verbs!" We are further told by the same author in another work[2] that "a savage may have a dozen verbs for 'I am here,' 'I am well,' 'I am tall,' 'I am hungry,' etc., because he has no word for 'am,'—and a dozen words for 'my head,' 'your head,' 'his head,' and almost any conceivable person's head, because he finds a difficulty in realizing the mere conception of any head apart from its owner." And we are assured that while these savages have an endless number of expressions for particular varieties of objects and actions, they have no general terms for a whole class of such objects or acts.

The account which has been given in the foregoing pages of the languages spoken by two races in the lowest stage of savagery will show how widely astray this ingenious and eloquent writer has been in his facts. Both Athabascans and Australians make abundant use of the substantive verb, and exhibit the power of abstraction in its fullest force. The savage Australian has no difficulty in distinguishing a head from its owner, and does it perhaps with more logical correctness of grammar than an Englishman. He employs the possessive pronoun in its genitive case like a possessive noun. *Walan* is head, and *kore* is man, the latter making in the genitive *korekoba*, man's; *emmoemba* is the genitive of the first personal pronoun; so we have *walan korekoba*, man's head (head of man), *walan emmoemba*, my head (head of me). Could the most analytic of "civilized tongues" do better than this?

It is observable that in all the objections which are made, all barbarous tribes are con-

[1] "Chapters on Language," by the Rev. Frederic W. Farrar, D.D., F.R.S., chap. 4, p. 45, American edit.

[2] "Families of Speech," Lecture iv, p. 400.

founded together, whereas they differ very widely in their intellectual qualities, and in the languages which manifest these qualities. One of the passages just quoted brackets together the American and Polynesian languages, which are at the very opposite poles in their lexical and grammatical characteristics. The Polynesian is among the simplest and least wordy of languages. It has, properly speaking, no inflections, and makes little use of "agglutination." The words are brief, usually of only two or three syllables. Its grammar is carried to almost the last degree of analysis—the mark, as we are assured by some writers, of high civilization and intellectual superiority. All the cases of nouns and all the moods and tenses of verbs are indicated by separate particles. *Fale*, is house; *te fale*, the house; *o te fale*, of the house; *ki te fale*, to the house. The plural is also indicated by a particle,—*na fale*, the houses. The Polynesian cannot, like the Iroquoian, combine the personal pronoun with the noun; he must say *lau ulu*, my head; *nau ulu*, thy head; *ana ulu*, his head; *te ulu o te tanata*, the head of the man. He has two particles which represent the substantive verb. There is no lack of general terms. Besides a name for each kind of fish and tree, there are generic words for fish (*ika*) and tree (*lakau*). Yet this simplest and most analytic of idioms is really a very poor one, with feeble powers of expression; and the people, when first known to Europeans, were still in a low stratum of barbarism, ignorant even of pottery or the use of the bow.

The truth is that not simplicity but complexity is the evidence alike of progress and of the energies which lead to progress. The simplest forms of animal life are the lowest, the most complex are the highest. Among inventions, compare the sickle with the reaping machine, the canoe with the steamship. The simplest of governments is the lowest, the patriarchal despotism; the two most complex of all actual governments are probably those of the British Empire and of the North American Federation, which are surely among the highest. The complexity of the American and Australian languages, rightly regarded, is the evidence, not of poverty of the powers of abstraction and analysis, but of the very reverse. I have had occasion to give elsewhere an account of an American people, the Iroquois, who, though possessing no greater natural advantages than the Polynesians, had reached a much higher plane in the arts, as well as in their social and political organization. Their language, in its elaborate structure, corresponds to this superiority, and accounts for it. As an instance of that complexity, which some scholars, like the esteemed author just now quoted, have too hastily condemned in these languages —while they doubtless admire it in the Sanskrit, the Greek and the German,—I may venture to quote the analysis of a word which fairly indicates the system and quality of this speech, and the inferences that may reasonably be drawn from it:[1]

"The word *teskenonhweronne*, which is rendered, 'I come again to greet and thank,' is a good example of the comprehensive force of the Iroquois tongue. Its root is *nonhwe* or *nonwe*, which is found in *kenonhwes*, 'I love, like, am pleased with,'—the initial syllable *ke* being the first personal pronoun. In the 'frequentative form' this verb becomes *kenonhweron*, which has the meaning of 'I salute and thank,' i.e., I manifest by repeated acts my liking or gratification. The *s* prefixed to this word is the sign of the 'reiterative form.' *skenonhweron*, '*again* I greet and thank.' The terminal syllable *ne* and the prefixed *te* are respectively the signs of the 'motional' and the 'cislocative' forms,—'*I come hither*

[1] "The Iroquois Book of Rites," in Brinton's "Library of American Aboriginal Literature," p. 149.

again to greet and thank.' A word of six syllables, easily pronounced (and in the Onondaga dialect reduced to five), expresses fully and forcibly the meaning for which eight not very euphonious English words are required. The notion that the existence of these comprehensive words in an Indian language, or any other, is an evidence of deficiency in analytic power, is a fallacy which was long ago exposed by the clear and penetrative reasoning of Duponceau, the true father of American philology. As he has well explained, analysis must precede synthesis. In fact, the power of what may be termed analytic synthesis—the mental power which first resolves words and things into their elements, and then puts them together in new forms—is a creative or co-ordinating force, indicative of a higher natural capacity than that of mere analysis. The genius which framed the word *teskenonhweronne* is the same that, working with other elements, produced the steam engine and the telephone."

The name of Duponceau recalls us to the special point of discussion—the true explanation of the origin of this remarkable wealth of forms and these evidences of discriminating power, which are found in many languages spoken by barbarous tribes. This eminent writer, distinguished alike as a scholar and a man of affairs, was (as has been said) the first to make a profound and philosophical study of the American languages and to compare them with other idioms in such a manner as to disclose the true principles of the science of comparative philology. Born in France in 1760, his talents and learning had secured him, at the early age of seventeen, the position of secretary to the well-known Court de Gébelin, author of many important works on philosophy, religion, and language. From this position he passed to that of secretary and aide-de-camp to Baron Steuben, and repaired with him to America, where, after the war of independence, he held an important office under the Federal Government. Admitted to the bar, he became so eminent in his new profession that he was offered the dignity of Chief Justice of Louisiana. In later life he returned ardently to scientific pursuits, became President of the American Philosophical Society of Philadelphia, and devoted himself especially to the study of the aboriginal languages. His best-known work on this subject is his "Memoir on the Grammatical System of certain Indian Nations of North America," which, written in French, was presented to the French Institute in 1835, and received the "Volney prize" for linguistic science. This memoir, which has been justly styled by an eminent and certainly not partial critic, "a most valuable and brilliant work,"[1] had been preceded by others less known, and particularly by a translation of Zeisberger's "Grammar of the Language of the Lenni Lenape, or Delaware Indians." To this translation, published by the American Philosophical Society in 1827, the translator prefixed a preface of considerable length, in which his view of the scope and principles of comparative philology is set forth, and is illustrated by many examples and much clear and powerful reasoning. Some passages of this essay which refer to our present subject may be cited. After referring to the great variety in the structure of languages, he remarks:

"It has been shown that the American languages are rich in words and regular in their forms, and that they do not yield in those respects to any other idiom. These facts have attracted the attention of the learned in Europe, as well as in this country; but they have not been able entirely to remove the prejudices that have been so long entertained

[1] Farrar: "Chapters on Language," chap. 4, p. 44, footnote.

against the languages of savage nations. The pride of civilization is reluctant to admit facts like these in their utmost extent, because they show how little philosophy and science have to do with the formation of language. A vague idea still prevails that the idioms of barbarous tribes must be greatly inferior to those of civilized nations; and reasons are industriously sought for to prove that inferiority, not only in point of cultivation, which would readily be admitted, but also to show that their organization is comparatively imperfect. Thus a learned member of the Berlin Academy of Sciences, in an ingenious and profound dissertation on the forms of languages [Baron William von Humboldt—"On the Origin of Grammatical Forms, and their influence on the development of ideas"], while he admits that those of the American Indians are rich, methodical, and artificial in their structure, yet will not allow them to possess what he calls genuine grammatical forms (*ächte Formen*), because, he says, their words are not inflected, like those of the Greek, Latin, and Sanskrit, but are formed by a different process, which he calls 'agglutination;' and on that supposition he assigns to them an inferior rank in the scale of languages, considered in the point of view of their capacity to aid the development of ideas. That such prejudices should exist among men who have deservedly acquired an eminent reputation for science is much to be regretted; and it is particularly with a view to remove them from the minds of such men that this grammar is published. The learned baron will, I hope, recognize in the conjugations of the Delaware verbs those inflected forms which he justly admires, and he will find that the process which he is pleased to call agglutinative is not the only one which our Indians employ in the combination of their ideas and the formation of their words."

After citing some striking examples of these modes of word-formation and inflection, the author comes to the point now under discussion. He remarks that in view of the considerable degree of art and method which have presided over the formation of the American languages, the question arises whether we are to suppose (as many had been inclined to believe) that this continent was formerly inhabited by a civilized race, or whether, on the other hand, it is not more reasonable to hold that men are "endowed with a natural logic which leads them, as it were by instinct, to such methods in the formation of their idioms as are best calculated to facilitate their use." He does not hesitate to decide in favour of the latter view, because, as he affirms, "no language has yet been discovered, among either savage or polished nations, which was not governed by rules and principles which nature alone could dictate, and human science never could have imagined." No language, he adds, "can be called 'barbarous' in the sense which presumption has affixed to that word." Culture stands for something, but for comparatively little. The question of the respective shares to be assigned to nature and to cultivation in the composition of such noble instruments as the languages of men is one well worthy of being thoroughly investigated. "The result, it is true, will be mortifying to our pride; but this pride, which makes us ascribe so much to our own efforts and so little to the silent operations of nature, is the greatest obstacle that we meet in our road to knowledge."

The result, therefore, of our inquiries—a result deduced alike from the evidence of language and that of history—is that a state of barbarism does not imply any inferiority in intellectual power. It simply indicates that the barbarous people have been compelled to live amid surroundings which rendered any advancement in culture impossible. Remove

the savage Athabascans to the bountiful pastures and fertile valleys of New Mexico, give them horses, cattle, and sheep to tend, and wheat and fruits and edible roots to cultivate, and presently their torpid faculties rebloom, and they become the quick-witted and inventive Navajos. Remove the shrewd, industrious, enterprising, improving Dravidians to the barren plains of Australia, and they sink in time to what has been deemed the lowest level of humanity.

This naturally leads us to consider some of the theories which have lately been put forth in regard to the condition and character of primitive man. Strange to say, the modern representatives of this unknown individual have been looked for in places where, by the common consent of all physiologists, he could not possibly have come into being—in Australia, in South Africa, in the Pacific Islands, and in America. Many works have been put forth in which speculations, based entirely on what has been learned of the inhabitants of these regions (but generally in utter disregard of the teachings of linguistic science), have represented the earliest men as sunk in the lowest debasement of mind and morals. In this "primitive horde," as it has been styled, human beings have been described as herding together like cattle, utterly without family ties, and living in what is euphemistically termed "communal marriage," or, in other words, in promiscuous intercourse. From this dismal condition, we are assured, they have slowly and gradually emerged, by long and painful struggles, of which the stages and methods have been ingeniously suggested, and the indications pointed out as surviving in various customs and institutions, such as wife-capture, mother-right, father-right, endogamy, exogamy, totemism, the clan-system, and others of like character. There is no doubt that all these customs or social conditions have prevailed among barbarous races, except only that of promiscuous intercourse, which, as Darwin has clearly shown, is contrary to the very nature of man as a "pairing animal," and never could have existed.[1] All of them are doubtless well worthy of careful investigation. But if the conclusions drawn from the facts recorded in the previous pages of this essay are correct, all these peculiar usages of barbarous tribes are simply the efforts of men pressed down by hard conditions below their natural stage to keep themselves from sinking lower, and to preserve as far as possible the higher level of intellectual, moral, and social life to which their innate faculties tended to exalt them. They are like the struggles of a bird in a cage to keep its wings in use for flight. A child who should assume that the primitive canary could only flutter for a distance of a few yards would be as wise in its inference as the philosopher who regards the Australians and Fuegians as representatives of primitive man. The physiologist sees at a glance in the structure of the bird's wings the kind of flight for which it was intended, and the philologist discerns in the Australian and Fuegian languages evidences of the mental endowments which, under other circumstances, would have placed the speakers of those idioms very far above their actual condition.

It may be well to attempt to gather from the evidence in our possession what was the real condition and character of primeval man. We possess in three important works, lately given to the world by three authorities of the first rank, the latest conclusions of science on the question of the probable birthplace of the human species. It is of interest to observe that these eminent authorities differ widely on certain important questions,

[1] On this subject the admirable work of Mr. Edward Westermarck, of the University of Finland, "The History of Human Marriage," (published since this essay was written) should be consulted.

M. de Quatrefages being a strenuous opponent of the Darwinian theory, of which Dr. Brinton is a no less decided supporter, while Mr. Wallace occupies, at least as regards the mental endowments of man, an intermediate position. Yet their opinions on the question under consideration are in close accord. All agree in holding that the human race is of much greater antiquity than was formerly supposed, going back at least into the early quaternary period. All are of opinion that the varieties, or "sub-species," which make up this race, are of one stock, which had its origin in a single locality, and all find this locality in the temperate zone of the eastern continent. They differ as to the precise position, but the differences are not very wide, and are easily reconciled. Finally all accord in placing the earliest men in a region and climate where their natural powers would have the fullest expansion, and their surroundings would be most favourable for the development of every faculty—where animals apt for domestication and plants suited for cultivation would be ready at hand. M. de Quatrefages would find the cradle of the human race in Asia, not far from the great central pile (*massif*) of the continent, and near the region which gives birth to all the great streams which flow to the north, the east, and the south.[1] Mr. Wallace, in like manner, finds this birthplace in the "enormous plateaux of the great Euro-Asiatic continent, extending from Persia right across Tibet and Siberia to Manchuria, an area, some part or other of which probably offered suitable conditions, in late Miocene or early Pliocene times, for the development of ancestral man."[2] Dr. Brinton, for reasons which he sets forth with much force of argument, is inclined to look for the cradle of the species further westward, near the Atlantic in northwestern Africa.[3]

These varying opinions may be reconciled in the same manner in which Dr. Schrader has sought, not without success, to conciliate, or rather to combine, the views of those archæologists who hold that the Aryan race had its primal home or place of development in central Asia, near the Oxus, with the opinions of those who find this home in central or eastern Europe, near the Danube. He holds that these localities were secondary centres, formed after the migration of the earlier members of the race eastward and westward, from their primitive home on the middle Volga.[4] In like manner it may be suggested that central Asia and north-western Africa were secondary centres, to which the earliest population overflowed from its primal seat in some intermediate position. This primal home of the species seems to be strongly indicated by historical and linguistic facts. The vast peninsula of Arabia, whose protecting deserts enclose fertile oases, some of them large enough to be the seats of powerful kingdoms, lies midway between the two regions, Egypt and Mesopotamia, in which the human race displayed in the earliest historical times its capacity for the highest culture. Their civilization goes back certainly to a date five thousand years before the Christian era, and probably to a long anterior period. The latest inquiries have led to the opinion that this civilization may have had its beginning in the quaternary or even in the pliocene era.[5] In fact, it is doubtful whether Egypt was ever occupied by a barbarous people. That its earliest inhabitants used implements

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[1] "Introduction à l'Etude des Races Humaines," p. 132 (1887).

[2] "Darwinism," p. 460 (1889).

[3] "Races and Peoples," p. 82 (1890).

[4] "Prehistoric Antiquities of the Aryan Peoples," part iv, chap. 14.

[5] See Brinton (quoting G. de Lapouge) in "Races and Peoples," p. 129. Wallace, in "Darwinism," p. 460.

of chipped stone, and were unacquainted with the metals, seems to be established. But it should be borne in mind that civilization does not depend upon a knowledge of the metals. It begins as soon as men have acquired a settled habitation, and have learned to tame the useful animals and to cultivate the useful plants. If the earliest men of the existing species possessed, as we have every reason to believe, intellectual faculties equal to those of their descendants, how long would they be in acquiring these first elements of civilization? Imagine the first human beings to be dwellers in a fruitful oasis of northern Arabia, and consider what must necessarily have been their social condition. Being human (to repeat a former remark) they must have spoken to one another in articulate language. And, moreover, we know from the laws of linguistic science that this language must not only have been a completely organized speech, but that it was more complex in its forms than any dialect which has been derived from it. If, for example, it was, as would seem probable from the supposed locality, a language of the Hamito-Semitic stock, it certainly did not belong to the group of Hamitic tongues, which are as much simpler in their forms, and therefore younger, than those of the Semitic group, as are the languages of Polynesia compared with the ancestral Malaisian tongues, or as is the English language compared with the German.

If the first human beings had all the natural instincts of their species, they belonged to the class of pairing animals. Their first social organization was that of the family. The first government was neither patriarchal nor matriarchal, but parental. The woman in her own sphere, and in her special prerogatives, was equal to the man. They were mutual helpmates. And in the first development of the arts of civilization, it is probable that the woman took the leading part. This part has been vividly suggested by an ingenious French writer, in a passage which well deserves to be quoted:—"It is to woman, I think," writes M. Elie Reclus, "that mankind owes all that has made us men. Burdened with the children and the baggage, she erected a permanent cover to shelter the little family. The nest for her brood was perhaps a hollow, carpeted with moss. By the side of it she set up a pole, with large leaves laid across, and when she thought of fastening three or four of these poles together by their tops the hut was invented—the hut, the first 'home.' She placed there the kindled brand, with which she never parts, and the hut became illuminated; the hut was warmed; the hut sheltered a hearth." "A day comes when by the side of a doe which the man has slain, the woman sees a fawn. It looks at her with pleading eyes. She has compassion on it, and carries it away in her arms. The little creature becomes attached to her, and follows her everywhere. Thus it was that woman reared and tamed animals, and became the mother of pastoral peoples. And that is not all. While the husband devoted himself to the greater game, the woman, engaged with her little ones, collected eggs, insects, seeds, and roots. Of these seeds she made a store in her hut; a few that she let fall germinated close by, ripened, and bore fruit. On seeing this she sowed others, and became the mother of agricultural peoples. In fact, among all uncivilized men cultivation may be traced to the housewife. Notwithstanding the doctrine which holds sway, I maintain that woman was the creator of the primordial elements of civilization."[1]

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[1] "Primitive Folk: Studies in Comparative Ethnology." By Elie Reclus (in the "Contemporary Science Series"): p. 58.

These happy suggestions of M. Reclus call for certain qualifications. The author does no more than justice to woman, but he does less than justice to man. He forgets certain primary impulses, as strong in man as in woman, though different. If the nest-making impulse, so to speak, is most powerful in her, the building instinct is strongest in him. As soon as she began to rear a shelter for her brood, the mechanical faculty would be aroused in him. The first cabin, like the first swallow's nest, would be the joint work of the first mated pair. If woman tamed the first gentle animal as a pet, man would discern its usefulness for food and clothing, and become the first herdsman. If woman sowed the first seeds, man fenced the field, and became the first agriculturist. This mutual aid, which is theory as regards the past, is fact at the present day among the Navajos and the Melanesians,[1] and the fact confirms the theory.

Granting an intelligent people, dwelling in a fruitful region, under a climate genial in summer, but rigorous enough in winter to make shelter and clothing necessary and the storage of food desirable,—with useful animals and plants near at hand,—how long a period would be needed for the arts essential to civilization to be invented and practised by them? Among some American nations, according to their traditions, less than five centuries seems to have sufficed, even with a scanty stock of such animals and plants. In five centuries the offspring of a single pair on an Arabian oasis, doubling in number only four times in a century, would have grown to a people of five hundred thousand souls, numerous enough to send out emigrations to the nearest inviting lands,—to the valleys of the Nile and the Euphrates. But these would have been bands of civilized men and women, familiar with agriculture, the rearing of domestic animals, housebuilding, weaving, and other arts of settled and regular life. We cannot imagine among them the barbarous usages and laws of wife-capture, exogamy, slavery, caste, and other like institutions, which have grown up in later ages among their debased descendants, who have wandered or been thrust into wilder regions, and have had to struggle with harder conditions. These luckless communities should be styled, not "primitive peoples," but "degenerate peoples." Yet in their languages, and indeed in the purposes underlying many of the very customs which are cited as proofs of their original and innate savagery, may be discerned, when rightly analyzed, evidences of the survival of those intellectual endowments which were displayed by their forefathers in the primeval civilizations of Arabia, North Africa, and Central Asia.

We return to the thesis with which our essay commenced. Unless it can be clearly shown that man is separated from other animals by a line as distinct as that which separates a tree from a stone or a stone from a star, there can be no proper science of anthropology. Geologists will readily admit that a stone is composed of star-dust, but they will say that it is star-dust which has assumed a form totally distinct from its original elementary condition. A treatise composed of facts and speculations showing how the matter of the earth was probably derived from star-dust would doubtless be very interesting to geologists, but it would not be deemed by them a treatise on geology. Geology commences where star-dust ends and the stone begins. A treatise which should undertake to show how inanimate matter became a plant or an animal would, of course,

[1] See the excellent work of the Rev. Dr. Codrington, "The Melanesians, their Anthropology and Folk-Lore." He tells us (p. 304), that "the respective shares of men and women in garden work are settled by local custom."

possess great interest for biologists; but it would not be accepted by them as a treatise on biology. That science begins when life appears. A work showing the chemical constituents of every species of plant would certainly be a valuable work; but it would be a work of chemistry, and not of botany. In like manner, a work displaying the anatomy of man in comparison with that of other animals cannot but be of great value; and a treatise showing how the human frame was probably developed from that of a lower animal must be of extreme interest; but these would be works, not of anthropology, but of physiology or biology. Anthropology begins where mere brute life gives way to something widely different and indefinitely higher. It begins with that endowment which characterizes man, and distinguishes him from all other creatures. The real basis of the science is found in articulate speech, with all that this indicates and embodies. Solely by their languages can the tribes of men be scientifically classified, their affiliations discovered, and their mental qualities discerned. These premises compel us to the logical conclusion that linguistic anthropology is the only true "science of man."

V.—*On the Moral and Metaphysical Element in Statistics.*

By Mr. GEORGE HAGUE.

(Communicated by Sir Wliliam Dawson, and read May 27, 1891.)

At the meeting of the British Association for the Advancement of Science held in Montreal some years ago, an interesting paper was read to the Economic Section, in which a comparison was made between the wealth of the United Kingdom and that of the United States. It was then concluded that the preponderance of wealth was in the United States.

There appeared about the same time, in an able financial journal in New York, a reference to the same subject. The reference had, as was evident, no connection with the paper read before the British Association. This journal, however, ridiculed the idea of the wealth of the United States being even on an equality with that of Great Britain, a conclusion which, as it was contrary to the patriotic instincts of an American and being from a competent authority, may be taken as worthy of note.

This divergence of view between authorities both entitled to speak with weight led me to a consideration of how far strict accuracy is attainable in certain departments of statistics; which involves the further question, how far any given statistical statements in their origin are affected by the mental and moral condition of those who furnish the primary materials for them.

I have come to the conclusion, after a somewhat long experience, that mental and moral elements are very powerful factors in the case.

The accuracy of statements respecting population, production, extent of trade, and amount of wealth, depends upon the accuracy of numerous compilations and comparisons. These compilations and comparisons are primarily founded upon statements made by numbers of single individuals of various degrees of mental capacity, who, besides having the liability to error common to all human beings, are at times swayed by tendencies of a political, national or moral character.

The whole question then of statistics carries us finally down to the character and competency of individuals, and the reliableness or otherwise of what they state.

1. It is obviously more easy to attain absolute accuracy with respect to some departments of statistics than with regard to others. Statistics of quantities, numbers and areas are more easy to arrive at than statistics of value.

It is easier to arrive at accuracy respecting quantities of things, than of numbers of people; easier to determine weights than numbers; more easy to obtain accuracy in counting things immovable than of things movable, or actually moving.

2. To illustrate the argument[1]:—

[1] The illustrations are taken either from England or the United States, as the original comparison which gave rise to this paper was as to their respective wealth.

It would be easy to compute how many ships or vessels there were in the harbour of Liverpool on a given day, provided it were perfectly understood within what limitations the word ship or vessel was used. It would be more difficult, for it would open the way for more error, to compute how many ships had been in the same harbour during a given year. There would be greater liability to error still if the computation were extended over half a century.

But let us suppose our object is to get the *tonnage* of all the ships in harbour on a given day. That would involve questions as to different descriptions of tonnage, and as to different kinds of registration, as between ships of foreign nations and those of Great Britain. (Such returns are, of course, constantly made. The question discussed in this paper is as to the influences that affect their accuracy). The tonnage for a whole year would be much less likely to be accurate than that for a single day. Still more liability would there be to error if the period were extended.

3. But to proceed :—It is desired to obtain an accurate statement of the *contents* or *cargoes* of all these ships on a given day. Here the factor of motion comes in to increase the perplexity of the problem, and also that of diversity of articles, and various standards of weight, bulk, and measurement. How is this summary of contents to be arrived at? An army of men might spread themselves simultaneously over the harbour and take an inventory of the contents of each ship. The liability to error in this case would be far in excess of the liability to error in the former cases, for the cargoes of these ships would be mostly in process of loading or unloading. But if instead of an actual examination reliance is placed upon documents and pieces of paper, invoices, bills of lading, and manifests, the liability to error would be greatly increased.

Such computations are, however, made, and form the subject of statistical returns from the ports and from the boards of trade of the United Kingdom. But obviously such an approximation to accuracy as is attainable in counting the mere number of the ships in port is out of the question in estimating their contents.

4. But passing from counting things to counting men, let us suppose we are endeavouring to ascertain the numbers of the crews of these ships in port on a given day. This is obviously a more difficult matter still. Some men are on shipboard, some are dispersed on shore. They cannot, therefore, be counted. If ships' rolls and registers are to be relied upon, it will be found that some men are in service and some are paid off. If, therefore, a census were to be taken of the crews of a given port on a given day there would always be the question: What constitutes a ship's crew when a ship is in port? Some would determine it in one direction, some in another, and the result would vary accordingly.

5. It is clear, however, that none of the foregoing approach in difficulty that which is involved if we are endeavouring to obtain statistics of value. What is the *value*, let us ask, of the cargoes of all the ships in the port of Liverpool on a given day? Here at once we are met by the question: What are we to understand by value? and next, How is value to be determined?

To commence with the cargo of a single ship, let us say, a general cargo. It is not difficult to ascertain that she contains amongst other things so many bales of cotton, and that these bales weigh so many pounds. But the value of this cotton is a matter of opinion; it is a metaphysical conception. There are in such cases different notions in the minds of different men, as they are buyers or sellers, as they are of a hopeful or desponding

temperament, as they are well informed or partially informed. Their position, temperament and intellectual condition would all affect their notion of value. Even in the case of such staple commodities as are dealt in on 'change, and for which there are daily quotations, the value of one day differs from the value of the next. But the ship, we will suppose, contains numerous articles that are not quoted on 'change; objects of curiosity, fancy goods, and manufactured articles from foreign countries, works of art, antiquities, rare specimens of plants, animals, and such like. What is the value of these? The answers to this question would reveal a far wider divergence than the answers to the other, and obviously there is room in such matters for a wide divergence of opinion.

6. The difference and variations hitherto spoken of have been matters of intellectual computation or opinion. But, as life is constituted, other elements are apt to appear and to affect the result. Let us suppose, for example, that there is rivalry between the great ports of the kingdom as to the extent of their trade, and that comparisons are instituted based on the estimates of a given year. Is it not certain that the largest estimates will be taken, and that where there is doubt the benefit of the doubt will be thrown in to swell the return? Particularly will this be the case if political power, in the shape of a greater or lesser number of members of Parliament, were made to depend upon it.

On the other hand, let us suppose the question to be one of taxation, not only with regard to certain well defined articles, but with regard to all articles whatever. In that case the tendency would be to minimize, instead of to magnify, and the benefit of the doubt would be taken in the other direction.

7. But whatever room there might be for difference of opinion as to the contents and value of ships in port, it would be immensely enhanced were the whole area of the city to be included in the computation. The number of houses would not be difficult to count. It would be more difficult, but not impossible, to make an accurate inventory of the contents of every dwelling, warehouse, shop and building in the city. But when the question of value came to be determined, it will be at once seen to be a matter of opinion, and that there would be room for differences of opinion to the extent of millions of pounds in estimates respecting ships and real property alone. The enormous masses of merchandise in wholesale warehouses or retail establishments would give rise to much larger differences. It is probable that differences in the estimates of the value of ships in harbour might amount to as much as forty per cent., in the value of the cargoes thirty per cent.[1] Even

[1] While writing this an instance of a difference of opinion as to valuation of shipping property has been the subject of public comment. In the recent annual report of a navigation company its ships are valued at certain figures. But in the report of an inspector for the government very different figures are found. Some of these differences are as follows:—

	Company's valuation.	Inspector's valuation.
Steamer "A."	£ 34,400	£ 17,400
"B."	27,800	11,600
"C."	25,000	13,200
"D."	17,300	11,400
"E."	16,000	9,000
"F."	16,700	9,000 and so on.

But the figures in both cases are really theoretical. The company, in all probability, enters the ships at what they cost, with deductions from time to time for wear and tear, etc., and, no doubt, if challenged as to the accuracy of the figures, they would state that the ships are worth so much to them in running order. On the other hand, the inspector, looking at the object from a different point of view, has an entirely different mental conception raised, and puts down certain figures which, in his judgment, the ships are probably worth, if sold at auction or bought at forced sale.

in the number of ships there might be a difference of five per cent.; in the number of the crews there might be as much as twenty per cent.; in the number of houses one or two per cent.; in the value of the houses thirty to forty per cent.; in the value of merchandise for sale fifteen per cent. on wholesale articles, and fifty per cent. on retail; while in the value of the contents of private houses the difference between the highest and lowest estimate might be as much as one to two hundred per cent. Yet in every one of these estimates there might be a fair amount of care exercised in determining quantities and numbers, and an honest judgment on the part of individuals in estimating values. The influences that sway men in one direction and in another would operate as powerfully as is expressed by these percentages. If moral and intellectual states could be expressed by numbers or mathematical signs, the differences between one man's mental condition and temperament and another man's may be as much as 10, 20, 50, 100 or 200 per cent.

8. But if what we have supposed done in Liverpool is extended over the entire area of the kingdom, we can see to what an extent such influences may operate in determining such matters as population, the *number* of cultivated or cultivatable acres of land, the number and *contents* of inhabited houses, factories, warehouses, public buildings, ships and mines, together with the amount of crops and production of the land and, finally, of the total *value* of the land, and of the various erections thereon for trading or manufacturing purposes, as well as the value of the stocks of merchandise contained therein, of ships and their contents, of mines, railways, canals, as well as goods in transit thereon, of the diversified contents of private houses, palaces, museums and galleries. Even to this, if we desired to estimate not only the value of what was contained within the borders of the United Kingdom itself, but the value of all the property owned by its inhabitants, we must add the value of similar properties in every British colony, in the empire of India, in the United States, and nearly every foreign country in the world, together with claims in the shape of bonds and shares, in the usufruct of innumerable other properties and enterprises in every country, such usufruct being gathered sometimes by taxation and sometimes by earnings of corporate enterprises as represented by interest and dividends.

The right to this yearly usufruct is, perhaps, a form of wealth more easily ascertainable than any other, inasmuch as in almost every instance it can be measured by public daily quotations. The value of consols and other Government securities, the amount of balances in banks and of actual cash on hand, the value of railway stocks and bonds, is about the only thing in which temperament or other influences could never enter in determining the question of value.

But, generally, it is safe to say that if an attempt were made to arrive at the total value of all that there is in the United Kingdom, and all that is owned by its inhabitants, there would be room for many different estimates, and the difference between the highest and the lowest might amount to thousands of millions sterling.

9. Every word of the foregoing applies to the United States or to Canada.

10. The figures given have hitherto been hypothetical, though the grounds upon which I have asserted that differences would arise are real and practical. I will now, however, come to matters in which the figures themselves will correspond with the actual occurrences of business life.

In the course of dispensing credit it is common with bankers to have balance sheets submitted to them by their customers. It is their unfortunate lot also sometimes to be

creditors of the same customers after they have become bankrupt, and to have balance sheets of their estates put before them prepared by other hands. The difference between the balance sheets of the same estate under these different conditions is often remarkable enough. Let me give a specimen of scores of such as every banker has had cognizance of.

A man of business applies for a banking credit for his firm and submits a statement of its affairs as follows:—

BALANCE SHEET OF A., B., C. & CO., 31ST DECEMBER, 1886.

Assets.		*Liabilities.*	
Stock in trade	£ 35,250	Bills payable for merchandise	£ 65,020
Book debts	25,700	Open accounts	7,550
Bills receivable	16,700	Due to bank	10,750
Cash in bank	3,500	Sundry other accounts	3,750
Factory and ground	65,000	Mortgage on factory and machinery	35,000
Machinery and plant	31,500	Do private property	3,000
Private property of partners	8,000		
	£185,650		£125,070
		Surplus	60,580
	£185,650		£185,650

Here is a balance to the good of £60,000; a very fair foundation for credit, as will readily be admitted. But, a few months afterwards, something happens, and the firm stops payment. They apply now, not for credit, but for a composition of their debts. The statement they submit has some striking points of difference as compared with the other. There has been little or no change in the real position, but there is a striking change in some of the figures:—

BALANCE SHEET OF SUSPENDED FIRM OF A., B., C. & Co., AS PREPARED BY X., Y., Z. & CO., ACCOUNTANTS.

Assets.		*Liabilities.*	
Stock in trade, actual worth 10s. in £	£ 17,000	Bills payable for merchandise	£ 65,000
Book debts, amount collectable at 6s. 8d. in the £ net	9,000	Open accounts for merchandise	8,000
(Amount formerly given included overdrawn accounts of partners.)		Due to bank	12,750
Bills receivable, value	13,000	Other amounts due	3,000
Cash in bank	150	Mortgage on factory	35,000
Factory property, including machinery and plant, real value in present condition of trade	30,000	Two years unpaid interest thereon (not mentioned before)	3,500
(Private property of partners never ought to have been brought in, being all subject to marriage settlements.)		Liability as indorser on sundry bills discounted on which there will be a loss of say	5,000
Total Assets	£ 69,150		
Deduct privileged liabilities which must be paid in full, such as wages, salaries, etc	5,000		
Net assets	£ 64,150		
Deficiency	68,100		
	£132,250	Total liabilities	£132,250

On this statement they propose to pay their creditors 6s. 8d. in the pound. An apparent surplus of £60,000 turns into an apparent deficiency of nearly £70,000, not by any change in the realities of the position, but by a change in the mode of estimating, which change is due to the change in the state of mind of the persons making the statement, which again was influenced by the different objects they had in view.

11. It is by such considerations as this we can understand the discrepancy in the figures of a great banking corporation when a balance sheet prepared by liquidators is placed alongside a balance sheet of nearly the same date submitted by the officials of the bank itself. Let us place two such statements side by side.

On the 31st December, 1887, the Universal Bank and Discount Company, with fifty branches, makes out its balance sheet as follows :—

Assets.		*Liabilities.*		
Cash in the bank	£ 850,000	Notes in circulation		£ 375,000
Cash in hands of banking agents and correspondents	125,000	Depositors		3,500,000
Clearances and exchanges	75,000	Current accounts		2,750,000
Stocks and bonds	250,000	Banking correspondents		120,000
Short loans on securities	150,000	Acceptances		565,000
Mercantile loans	2,350,000	Total liabilities		£7,310,000
Do discounts	4,645,000	Surplus		1,850,000
Claims for acceptances	565,000	Being—		
Bank premises and other freehold property	150,000	Capital	£1,500,000	
		Reserve fund and profits carried forward	350,000	
Total assets	£9,160,000			£9,160,000

This statement is signed by the chief accountant of the bank and certified as having been truly extracted from the books. And so it was, and it was correct, so far as his knowledge extended.

The statement is presented to a board of directors, a majority of whom probably know but little of the vast complication of accounts which go to make up the small set of figures above given. And the whole board meet a body of shareholders and present the figures to them.

But within a few months something happens ; confidence for some reason is weakened ; deposits to a large amount are withdrawn. After a brief struggle the bank closes its doors. Professional accountants now investigate, but their investigation deals far more closely than the former one with the element of real value, or what is considered to be such. The business of the parties who now have matters in hand is not only to bring out a correct balance sheet, but a correct valuation. The moral and metaphysical element before spoken of now operates differently. These men have a different object. They are in a different state of mind. They look from a different point of view, and they bring out very different results. The figures representing most of the assets have undergone significant changes.

The auditors' account is as follows :—

Assets.		*Liabilities.*	
Cash in bank	£ 250,000	Notes in circulation	£ 325,000
Cash in hands of banking agencies and corporations	75,000	Depositors	2,750,000
Clearances and exchanges	75,000	Current accounts	2,500,000
Stocks and bonds, real value	200,000	Banking correspondents	120,000
Short loans on securities (estimated to yield)	100,000	Acceptances	565,000
Mercantile loans after writing off losses and allowing for doubtful accounts	1,850,000		
Mercantile discounts, real value after making same allowance	3,940,000		
Claims against acceptances, real value	475,000		
Bank premises and other property, saleable value	75,000		
Total assets	£7,040,000	Total liabilities	£6,260,000
		Surplus	780,000
			$7,040,000
		Reserved fund all gone and only half capital left.	

These are surprisingly different figures from the former ones. And when creditors or stockholders meet there is an indignant outcry. Nothing can be more natural in such cases. The object of the present paper is not to discuss the degrees of culpability attaching to directors who have put forth the former statement. It may consist of simple negligence in some and of gross negligence in others. Some may have been negligent in but seldom attending meetings of the board. Others, who have really paid attention to the business, may have made great and even culpable errors of judgment in computations of the outcome of insolvent and doubtful estates, spread over vast areas of country and, perhaps, over different countries of the world.

Or there may have been on the part of one or two, and possibly of all, such an amount of knowledge as would make the presentation of the former set of figures a deliberate act of misrepresentation or concealment, and such as to imply fraud and criminality.

These considerations might be enlarged on almost to any extent. It is, however, sufficient for the purpose of this paper merely to suggest them, and to add that when the statements of vast numbers of merchants, corporations, or moneyed institutions are gathered together into the immense totals which appear in the returns relating to nations and countries, due allowance should be made for such considerations as the foregoing.

12. To illustrate the bearing of the line of thought with which we set out, let us consider whether, and to what extent, this moral element will affect statistics of wealth, population, etc., on the two sides of the Atlantic respectively.

Let us take first the case of the United States and note what elements, if any, there are which would affect the calculation, and sway any doubtful issues towards one side or the other.

13. To begin with, the fact is to be noted that in the government of the United States numbers have a direct and constant bearing on political power. Representation is almost wholly by population. The more population, the more votes; and with votes, victory for a person, a party, or a cause, with all the material benefits that follow in the train of victory.

No one who has not lived either in the United States or on their borders can appreciate the extreme keenness with which numbers are estimated, and the natural tendency, whenever numbers come into play in such a manner as to affect political power or national preponderance, to exaggerate them. The small towns and counties of rural districts exaggerate their numbers in order to overbalance the importance of the large cities of the same state. For there are many matters in which their interests clash. The strong interest of the cities is to swell their population in order to attract capital and enterprise to themselves; and, further, to over-estimate the value of real estate within their bounds, in order to enable them to negotiate loans on better terms.

There is the same rivalry between manufacturing cities and seaports, and between commercial centres in different sections of the country. Each state and each group of states is self-asserting, partly for the sake of political weight in the national councils and partly that they may draw population and immigration.

14. To such state it is a matter of business (pursued with all the keenness of a practiced merchant in older lands) to attract capital, settlers and labourers, a condition of things absolutely unknown in England, and to one not familiar with it by experience almost unthinkable. This is particularly noticeable in the newer states that have vast areas of uncultivated lands for sale. Every possible interest leads to the magnifying of the number of acres capable of cultivation, of the crops produced, and of the value of farming lands as distinguished from wild lands. For the more such farm lands can be made to appear worth, the greater the attraction to the immigrant to come and surround himself with such favourable circumstances, looking himself to have equally valuable cultivated land by-and-by. The values of lands, buildings, improvements and crops are almost universally put down on an exaggerated scale by each owner whenever value has to be spoken of, provided only that taxes have not to be paid thereupon.

It arises out of this condition of things that the amount on which taxes are paid, and the amount which persons call the value, are widely different. They differ sometimes as much as 200 and even 300 per cent.

A typical instance came under my notice recently. A newspaper in the populous state of Michigan brought forward some figures relating to the wealth of the state. The actual and ascertainable figures were those of taxation value as determined by assessments. The paper went on to say that on the average it might fairly be estimated that the real value of these properties and lands was three times as much as the taxing value; that, therefore, the wealth of the state might be put down at such and such a figure, which was exactly three times the amount on which taxes were paid. This instance is typical.[1]

[1] The assessment value of all the property of the state of Michigan, according to the latest returns accessible, is $654,580,000. Multiply this by three and we have $1,963,740,000. The difference between the two is the measure by which we can estimate the working of moral and metaphysical forces in considering such questions. I would not dwell upon this were it not a type of a deep seated and universally prevailing practice familiar to all residents of the United States and Canada.

Statistical columns, headed "value of property," are invariably filled up with much larger figures than men are willing to pay taxes upon. Now, considering that the authority to whom taxes are paid has something to say in the matter, and that the figures of assessment are really the result of conflict between the ideas of the taxer and the taxed, there is a natural safeguard against taxing values being placed unreasonably low. And experience shows that when the value of property is subjected to the only process which brings out the real value, namely, the offering for public sale after fair notice, the taxation value is generally found to be more nearly correct than the metaphysical notions current in the brains of owners of property, which are entered in county and state returns as value.

15. It is to be remarked that in the older communities of the Eastern States, where values have been settled by a long course of buying and selling, the difference between the assessment and the real value is generally much less than in the newer communities of the West.

But taking the whole area of the United States (a prodigious term to use) there can be little doubt that values are placed at higher than taxing figures to the extent of thousands of millions of dollars.

16. These disturbing influences arise even when simple questions of population are entered upon. National vanity is a potent factor in the determination on the side of exaggeration. So also is pride of strength, place and power among the countries of the world. If the question is as to the population of particular states, it is for preponderance of power in the councils of the nation. In such an enormous territory, sectional questions are continually arising which give rise to the keenest disputes, and the finest arts of manœuvring find exercise in dealing with questions of sectional population.

But it is when endeavouring to determine the amount of national wealth in the shape of public property and in the value of great public works (such as railways, canals, etc., other than public property) that the most intricate questions as to what constitutes real value arise. The fierce competition for constructing railroads, which has occasioned every main line to be duplicated or triplicated, has naturally depreciated the market value of the stocks and bonds of the roads in question. Certainly, in this case, the market value at any particular time is the real value at that time. For it is the final residuum of the conflicting ideas of large numbers of buyers and sellers settling themselves in the end down to quoted figures. Yet, in any estimates or statements of national wealth, it is beyond doubt that such railway property would be valued at what it cost, which figure would sometimes be 1,000 per cent. more than the other.

17. Turning now to England, and examining the conditions which influence estimates there, we find a state of things diametrically opposite. There is no tendency to exaggerate for the purpose of drawing population to the country. For population is redundant. And there is no rivalry between counties (which are the nearest counterparts of the American states), nor is there between towns and cities, for the establishment and growth of new industries, for these have been settled in fixed localities for generations.

There is no need to exaggerate wealth for the purpose of strengthening national credit, for England does not borrow from other countries. With respect to national glory, national position, and national strength, these, too, have long been settled beyond controversy. And, as is well known, the national habit is rather to minimize wealth

than to exaggerate it. This is a long settled tradition, well fixed in the national character. The tendency to exaggerate wealth is foreign to the English habit of mind. The people, as a rule, are secretive in that respect. There is private emulation and rivalry about wealth, as is well known; but whenever the matter of making statements, filling up returns, and giving material for large and general estimates come into play, there is a tendency to made things less rather than more. If a number of landowners were asked the value of their property a majority of them would without doubt state it at less, rather than more, than what they could sell it for, or were willing to be taxed for it.

18. Taking, then, these two opposite tendencies in England and the United States respectively, there would be two elements of error in the great comparison attempted to be instituted; a universal tendency to exaggeration on the one side, and a considerable tendency to diminution on the other. It is easy to see how fallacious any comparison would be under such circumstances.

19. To sum up the whole matter:—

In all statistics the moral and metaphysical element must be taken into consideration. This is especially the case where, from an immense number of small data, calculations with respect to large areas and large numbers have to be determined. Small initial errors in such cases may lead to a gigantic error in the final result, just as an error in the size of an angle, which may be almost imperceptible at the beginning, may become millions of miles when the lines are carried out to astronomical distances.

The principle above enunciated has a wide application. It has to be borne in mind in estimating the value of all statements as to the population and revenue of cities, states, and nations, the amount of their crops, the product of their industries, and estimates of their military strength. It comes into play also in reading of the number of soldiers on each side in a battle or campaign; the cost of certain wars and, most of all, the amount of national wealth. In all these matters there may be room for various modes of computation, various methods of valuation, according to the state of mind of the individuals concerned, as the object aimed at may be of one or another kind, and with widely varying results.

It follows, therefore, that statistical totals should always be received with caution under the following circumstances:—

1. When, from the nature of the case, anything approaching to absolute accuracy is impossible of attainment, and large totals are built up by multiplication of uncertain initial figures.

2. When political objects are to be obtained by a statement in one direction or another.

3. When national pride or vanity is concerned, or where figures are taken as the foundation, or support, of theories, economical, political, social, or ecclesiastical.

VI.—*The Beothiks or Red Indians of Newfoundland.*

By the REV. GEORGE PATTERSON, D.D.

(Read the 29th May, 1891.)

INTRODUCTORY.

The history of the early intercourse of Europeans with the rude aborigines of America presents one of the darkest pictures on the page of time. Occasionally its blackness may be, in some measure, relieved by such events as the friendly dealings of Penn with the tribes inhabiting Pennsylvania, or the self-denying labours of Christian missionaries; yet these only serve to throw into deeper shade the oppression and cruelty, the robbery and murder, and the destructive consequences of European vices, which, to a greater or less extent, have characterized the early attempts of every nation in Europe to colonize this continent.

Perhaps no part of this history is sadder than that which concerns the doom of the Red Indians of Newfoundland. Here was a people described by all who met them as of good, if not superior, physique, and in the arts of uncivilized life showing much intelligence, numerous as compared with tribes on the neighbouring continent, in the midst of lavish abundance supplied to their hands by a bountiful Creator, a people too at their first intercourse with Europeans disposed to be friendly, yet goaded into a spirit of relentless hostility, and finally exterminated as noxious wild beasts, leaving neither name nor inheritance on the earth. Such a fact may well excite serious consideration and awaken deep emotions.

From the entire separation or bitter hostility between them and the whites, maintained during almost the whole time that the two were brought into contact, our knowledge of them is imperfect, and so it must remain, for they have no buried records for any future explorer to decipher, and it cannot be expected that any future collecting of their relics will add much to our information concerning them. In these circumstances I have thought it advisable to collect what is known of them, that it may be placed on record in the 'Transactions' of the society. In prosecuting this work I must acknowledge my obligations to the various histories and other works on Newfoundland which refer more or less fully to the aborigines.[1] Besides these I have availed myself of special articles by different writers in serial publications, and have gathered information from various other

[1] The principal are McGregor's "British America," Edinburgh and London, 1832; Anspach's "History of Newfoundland," 1827, p. 457, etc.; Chappell's "Voyage to Newfoundland," London, 1818, pp. 169-187; Bonnycastle's "Newfoundland in 1842," Vol. i, pp. 251-278; Jukes' "Excursions in Newfoundland," London; Pedley's "Newfoundland," London, 1863; Tocques' "Newfoundland as it was," London, 1878; also his "Wandering Thoughts," and especially Harvey's "Newfoundland," London and Boston, 1883.

sources, published and unpublished, which will be more particularly referred to in the sequel.

I may remark that Beothiks, sometimes spelled Bœothicks, was their own tribal name. Attempts have been made to determine the meaning and origin of the word; but as we have no real information on the subject, and the conclusions adopted are only inferences from its etymology, we think that none of them are reliable. Some of them, indeed, we regard as demonstrably false. Mr. J. P. Howley mentions an Eskimo word, *bethuc*, meaning forefoot of deer. We presume to think he might as well have mentioned the English word, boathook. Latham supposed that it meant good-night in their language. This was founded on a copy of Mary March's vocabulary, hereafter to be referred to, in which the word *betheok* appears for good-night. But on examination of the original, it is found that the word is *betheoate*, a form of the verb *baetha*, to go home, and meaning, I am going home. Gatschet, justly rejecting these interpretations, supposes that "it means not only Red Indian of Newfoundland, but is also the generic expression for Indian, and composes the word haddabothic, *body* (and belly), just as many other people call themselves by the term men." This appears to me far-fetched, and I believe that, like the name of other Indian tribes, such as Micmac, etc., though it must once have had a meaning, which was the occasion of its application to them, this has long since been lost, and that it had become merely their tribal designation.

The name Red Indians is supposed to have been given to them by Europeans from their practice of colouring their faces and utensils with red ochre. The name, however, I believe originated before the arrival of white men. It is the translation of the Micmac name for them, *Maquajik*, which means red men or red people.

II.

Early Notices.

Going back to the earliest notices of them, it is probably to them that Cabot refers when, according to Hakluyt, he says: "The inhabitants are painted with red ochre. They use the skins and furs of wild beasts for garments, which they hold in as high estimation as we do our finest clothes. In war they use bows and arrows, spears, darts, clubs and slings."

The first undoubted reference to them is in "Fabian's Chronicle" as follows: "In the fourteenth year of Henry VII, there were brought unto him three men taken in New Found Island by Cabot. They were clothed in the skins of beasts, and spoke such speech as no man could understand them, and in their demeanour were like brute beasts, whom the King kept for a time after, of the which, about two years ago, I saw two apparelled after the manner of Englishmen, in Westminster Palace, which I could not discern from Englishmen, till I was learned what they were."

What became of these men we are not informed. It is not quite certain that they were from Newfoundland. They might have been from Cape Breton or Nova Scotia.

It is almost certain, however, that it is the Beothiks that are brought under our notice in the voyage of Gaspard Cortereal in 1501. In that year he sailed with three vessels on a voyage of exploration, prosecuting the work which he had begun the year

before. I have shown in another place[1] that the principal scene of his explorations was the east coast of Newfoundland, and probably part of Labrador. On this expedition he captured fifty of the natives, men, women and children, intending them for slaves. Two of his vessels in which they were embarked reached Lisbon safely, but the one in which he sailed himself was never heard of. We have said in that place that it is quite possible that he and his crew fell a victim to the vengeance of the remaining members of the tribe. The unfortunates carried away were seen by Pasqualigo, the Venetian ambassador at Lisbon, who describes them as "of like colour, stature and aspect, and bearing the greatest resemblance to the gypsies." By those on board they were described in their own land as numerous, and in person well built, as living in wooden houses, clothing themselves in skins and furs, and using swords made out of a kind of stone, and pointing their arrows with the same material. Farther Pasqualigo tells us that "His Serene Highness contemplates deriving great advantage from the country, not only on account of the timber of which he has occasion, but of the inhabitants, who are admirably calculated for labour and the best slaves I have ever seen." Such was the treatment that these people received almost at their first meeting with Christian civilization, and we believe that it was the beginning of that bitter hostility between the two which, continued through subsequent generations, ended in the entire extermination of the weaker race.

For about three-quarters of a century we have no notices of them, except that of Jacques Cartier, who met them on his voyage in 1534, and thus describes them: "They are of good stature, but wild and unruly. They wear their hair tied on the top like a wreath of hay, and put a wooden pin in it, or any other such thing instead of a nail, and with them they bind certain birds' feathers. They are well clothed with beasts' skins, as well the men as the women, but the women go somewhat straighter and closer in their garments than the men do, with their waists girded."

According to Hakluyt, in the year 1536, an expedition, under Mr. Hore, with 120 souls, sailed for Newfoundland. That worthy author travelled 200 miles to see the last survivor of the expedition, who informed him that "after their arrival in Newfoundland, and having been there certain days at anchor, he saw a boat with savages rowing towards them to gaze upon the ship and our people. They manned their ship's boat in order to have taken them, but they fled to an island in the bay and escaped our men. They found a fire and a side of a bear on a wooden spit, also a boot garnished on the calf as it were with raw silk, also a great warm mitten."

During the remainder of the 16th century we have only two brief notices of this people. The first is by Martin Frobisher, in 1574. Having been driven by the ice on the coasts of Newfoundland, some of the natives came on board, and with one of them he sent five sailors on shore, whom he never saw again. On this account he seized one of the Indians and carried him to England, where he died shortly after his arrival.

The second is by Ed. Hayes, who wrote the narrative of Sir Humphrey Gilbert's expedition in 1583. He says: "In the southern parts we found no inhabitants, which by all likelihood have abandoned these coasts, the same being frequented by Christians. But in the north are savages, altogether harmless."

In the year 1610 was made the first attempt at colonization on the island; a company

[1] "The Portuguese on the N. E. Coast of America," in 'Transactions of Royal Society of Canada,' 1890.

was formed under royal sanction, headed by several distinguished men, among whom the most noted was the great Bacon. To them a patent was issued granting a large part of the country, and they sent out a colony, under the charge of Mr. Guy, a merchant, and afterwards mayor, of Bristol, as governor. These landed at Mosquito Harbour on the north side of Conception Bay, and proceeded to erect huts. Mr. Guy explored the coast and had friendly intercourse with the natives, and during the short time that the colony lasted he treated them with such kindness as entirely to win their confidence, and to begin with them what promised to be a prosperous trade.

But the best early account of them is that given by Richard Whitbourne, who, besides making a number of voyages to this quarter, in 1615 received a commission from the British Admiralty to proceed to Newfoundland, to establish order among the fishing population, and to remedy abuses which had become prevalent among them. After his return, in 1622, he published a work entitled "A Discourse and Discovery of Newfoundland," in which he describes the Indians as follows :—

"The natural inhabitants of the country, as they are but few in number, so are they something rude and savage people, having neither knowledge of God, nor living under any kind of civil government. In their habits, customs and manners they resemble the Indians on the continent, from whence I suppose they came. They live altogether in the north and west part of the country, which is seldom frequented by the English. But the French and Biscaines (who resort thither yearly for the whale fishing and also for the codfish) report them to be an ingenious and tractable people (being well used). They are ready to assist them with great labour and patience in the killing, cutting and boiling of whales, and making the train oil, without expectation of other reward than a little bread or some such small hire."

A conclusion is added to the discourse in which he says: "It is well known that they are an ingenious and subtill[1] kind of people (as it hath often appeared in divers things), so likewise are they tractable, as hath been well approved, when they have been gently and politickly dealt withall: also they are a people that will seek to revenge any wrongs done to them, or their wolves, as hath often appeared. For they mark their wolves in the ears with several marks, as is used here in England on sheep and other beasts, which hath been likewise well approved; for the wolves in those parts are not so violent and devouring as wolves are in other countries.

"The natives of these parts have great store of red ochre, wherewith they use to colour their bodies, bows, arrows and canoes, in a painting manner, which canoes are their boats, that they use to go to sea in, which are built in shape like the wherries on the river Thames, with small timbers no thicker nor broader than hoops; and instead of boards they use the barks of birch trees, which they sew very artificially and close together, and then overlay the seams with turpentine (probably fir-balsam), as pitch is used on the seams of ships and boats And in like manner they use to sew the barks of spruce and fir trees, round and deep in proportion, like a brass kettle, to boil their meat in, as it hath been well approved by divers men; but most especially to my certain knowledge, by three mariners of a ship of Tapson, in the county of Devon, which ship riding there at anchor near by me, at the harbour called Heart's Ease, on the north side of Trinity Bay, and being robbed in the night by the savages of their apparel and divers

[1] This word seems to be used not in its present sense, but in its original of skilful, clever or ingenious.

other provisions, did the next day seek after them, and happened to come suddenly where they had set up their tents and were feasting, having three such canoes by them and three pots of such rinds of trees, standing each of them on three stones, boiling with twelve fowls in each of them, every fowl as big as a widgeon and some so big as a duck. They had many such pots so sewed and fashioned like leather buckets that are used for quenching fire, and those were full of the yolks of eggs that they had taken and boiled hard, and so dried small as if it had been powder-sugar, which the savages used in their broth as sugar is often used in some meats.

"They had great store of the skins of deers, beavers, bears, seals, otters, and divers other fine skins, which were excellent and well dressed, as also great store of several sorts of flesh dried; and by shooting off a musket towards them they all ran away naked without any apparel, but only some of them had their hats on their heads, which were made of sealskins, in fashion like our hats, sewed handsomely, with narrow bands about them, set round with fine white shells. All their three canoes, their flesh, skins, yolks of eggs, targets, bows and arrows, and much fine ochre and divers other things they (*i.e.*, the vessel's crew) took and brought away and shared it among those that took it. They brought to me the best canoe, bows and arrows and divers of their skins, and many other artificial things worth the noting."

The statement regarding the wolves is a very curious one, and will engage attention hereafter. The forming of dishes of bark or even of rushes, tight enough to hold water, in which they boiled their food, as here described, was common among the Micmacs and other American Indians. But the boiling was done by putting red-hot stones into the vessel. And it is said that it could be done more quickly in that way than in the ordinary manner.

He also asserts that Trinity Bay was avoided by vessels, partly from certain rocks, but partly because the natives resided in the neighborhood and "secretly came unto the bay and harbour in the night time, purposely to steal sails, lines, hatchets, hooks, knives and such like." He also says that at that time they never came to the south of Trinity Bay.

We may just add the description given by De Laet in his "Novus Orbis": "They are of medium stature, with black hair, broad face, large eyes. All the males are without beards. Both sexes stain not only their skin but their clothing with a certain red colour. They dwell in humble lodges formed of poles arranged in a circle and joined at the top. They very often change their dwelling places."

Omitting for the present any discussion of their origin, migrations and ethnological relations, we may observe that at that time Newfoundland must have been a paradise for a race of hunters. Countless herds of caribou roamed through the interior, passing from north to south in autumn and returning in spring. Vast flocks of ptarmigan, as well as smaller game birds, were everywhere to be met with; wild geese bred on its lakes, sea-fowl in equal abundance thronged its coasts, while its rivers and countless lakes, as well as the sea washing its shores, swarmed with fish of every variety. Even now there are few better hunting-grounds than Newfoundland. What must it have been before the white man occupied its harbours, and when the sound of their firearms had not disturbed the vast solitudes of the interior. With the skill of the red man in capturing the denizens of the stream and forest, this people must have lived in a rude abundance. The great

want must have been of vegetable food. This would, however, be partly supplied in summer by the abundance of berries found everywhere.

What their numbers may have been we have scarcely any means of judging. The territory they occupied was as large as that occupied by the Micmacs in Nova Scotia and New Brunswick. As compared with the extent of the island, they must have been few. But from the notices of their presence by the early voyagers, and the number of places where tokens of their occupancy have been found, I believe that they could not have been less numerous than that tribe, whose number was never great, probably not much exceeding four thousand.

These are all the early notices of the Beothiks we possess, and they give us little specific information regarding them. The descriptions would apply nearly as well to any of the tribes at that time inhabiting Northern America. It seems clear, however, that they were a people moderately tall and well formed physically, and that they appeared to the visitors as of quick intelligence. It is specially, however, to be noted that all these writers agree in describing them as mild and tractable. They at first received their visitors in a friendly manner, and were desirous of being on good terms with them. Certainly there does not appear anything more fierce in their disposition, than was to be found among any of the tribes on the mainland with which the English or French came in contact. On the contrary, these accounts rather seem to show that they were distinguished among the American aborigines for mildness and gentleness of disposition. On the other hand, Cortereal's carrying away more than fifty of them, men, women and children, into slavery; Cabot's capturing and carrying some to England; Mr. Hore's attempt, as described by himself, to do the same; Whitbourne's coolly appropriating their property, not to speak of the unrecorded deeds of the rude men who, under no restraints of law, came to trade and fish on the coast, indicate that from the first white men regarded them and theirs as their natural prey.

III.

Hostilities.

Even at the time that Whitbourne wrote all friendly relations had not ceased. But when next we hear of them the two parties are on a footing of unrelenting hostility. The white men accused the natives of stealing their goods. Among all the American tribes at that time there was a sort of communism. To a certain extent a whole village shared in the produce of the chase, and the supplies of one were readily given to meet the wants of any in need. When they met white men they were ready to give them freely of what they possessed, but they expected the same liberality in return. Their views being misunderstood led to collision. Though we know that in general the Indian tribes were not given to thieving, yet cases of the crime would occur: and when we consider the value to them of articles of European manufacture, as nails, knives, hatchets, etc., we need not wonder that the temptation should sometimes prove too strong for them By the rude hunters, trappers and fishermen the missing of some trifling article came to be regarded as sufficient excuse for shooting the first Indian they might meet. These men were the reckless of many nations; they were here beyond the control of law, there being

no administration of justice on the island, except what they set up themselves, and the rude aborigines they regarded as having no rights which white men were bound to respect. Their avarice, too, was excited by the skin dresses or the rich fur robes in which these poor creatures wrapt themselves at night, or even in which they laid their dead to rest, and they did not hesitate to take possession of them, even if this involved the shooting of the owners. And when such wrongs led to retaliation on the part of the injured red men, it only excited their enemies to a more determined effort to exterminate them as they would so many wolves. In this warfare what chance had the poor natives, with their bows and arrows, against the deadly firearms of the whites.

But another circumstance must be mentioned. In the year 1660 the French had established themselves at Placentia, and in subsequent years extended their authority along the southern coast. On the mainland they had secured the attachment to their interests of the various Algonkin tribes with whom they came in contact, but in this respect they were as unsuccessful with the Beothiks as they were with the Iroquois. Some misunderstanding having arisen between the French authorities and them, the former offered a reward for the heads or persons of certain of their chiefs.[1] A number of Micmacs had been brought over from Cape Breton or Nova Scotia. They are said to have been friendly to the Beothiks up to this time, but this offer excited their cupidity, and, according to tradition, there occurred a scene, thus described by Hon. A. W. Des Barres, formerly one of the judges of the Supreme Court of Newfoundland: "Some of the Micmacs were tempted by the reward, and took off the heads of two of them. Before the heads were delivered to obtain the reward, they were by accident discovered concealed in the canoe which was to convey them, and recognized by some of the Red Indians as those of their friends. The Red Indians gave no intimation of the discovery to the perpetrators of the outrage, but consulted among themselves and determined on having revenge. They invited the Micmacs to a feast, and arranged their guests in such order that every Beothik had a Micmac by his side. At a preconcerted signal every Beothik slew his guest. They then retired quickly from those places bordering on the Micmac country. War of course ensued. Firearms were little known to the Indians at this time, but they soon came into more general use among such tribes as continued to hold intercourse with Europeans. This circumstance gave the Micmacs an undisputed ascendancy over the Beothiks, who were forced to betake themselves to the recesses of the interior and other parts of the island, alarmed, as well they might be, at every report of the firelock."[2]

I am inclined to believe, for reasons to be given hereafter, that the Micmacs and they were hereditary foes. If, however, they were on the first arrival of the latter in Newfoundland friendly, this state of things was soon superseded by one of mutual and relentless hostility. Jukes ("Excursions in Newfoundland") says that in 1770 a battle took place between the two tribes at the north end of Grand Pond. There must be a mistake about the date. It is more likely to be in 1670. He also says that the Beothiks called them Shonaks or Shawnaks, *i.e.*, "bad Indians." At all events, in the historic period the Micmacs were their most implacable foes, and members of the two tribes sel-

[1] This is told by M. Tocque, as well as by Judge Desbarres, in the speech to be quoted immediately. But they do not give their authority for the statement.

[2] Speech delivered at the meeting of the Boeothic Society in the year 1827. The story, without the first incident of the Micmacs' treachery, was told by an old Micmac to Mr. Peyton.

dom met without bloodshed. It is also said that their relations with the Eskimos on the north were characterized by similar hostility. Till English settlement checked the advance of this people, they used to frequent the east coast. It is understood that when they met the Red Indians it was always as enemies. But Cartwright says that "they kept to their favourite element, the water, where their superior canoes and missile weapons for killing whales rendered them terrible enemies to encounter." The Red Indians hated them, speaking of them as dirty. With the Indians on the Labrador coast, whom they called Shawnomunes, they are said to have been on friendly terms, sometimes visiting and carrying on some trade with them.

Originally the Beothiks had established themselves on the coast. This is evident from the fact that the first voyagers met them there, but more especially from their kitchen middings which have been found at various places, and also from the graves sometimes found on islands off the coast. But now they were driven into the interior, and only visited the coast by stealth and at the risk of their lives. So much was this the case that Charlevoix, writing about the middle of the 18th century, says that there were no inhabitants in Newfoundland except the Eskimo, who, he says, came down along the coast in summer. The Beothiks had by that time been so driven into the interior or to the northern parts of the island, that the learned author was not aware of their existence.

So the Baron de La Hontan, who in his younger years had been governor of the French colony of Placentia Bay, does not mention the Beothiks in his "Voyages." About 1690 he wrote: "The Eskimo cross over to the island of Newfoundland every day at the streights of Belleisle, but they never come so far as Placentia for fear of meeting with other savages there. (*I.* 210, *Eng. translation of* 1735.) There are no settled savages on the island." From this it is evident that the Beothiks even at that time confined themselves to places at a distance from those resorted to by the whites.

But they were still in considerable numbers, as their works to be noticed presently show. Their principal resort was the region of the Exploits River, the largest on the island, having a course of 200 miles and emptying into the Bay of Exploits, a branch of Notre Dame Bay. An expansion of it known as Red Indian Lake, about 36 miles long, by from half a mile to three miles wide, situated from 70 to over 100 miles from the mouth, was their headquarters.

But the work of destruction continued. Northern furriers and fishermen continued to shoot down the Beothiks, sometimes in wantonness, sometimes in professed fear of them, sometimes in the spirit in which they would shoot a wolf, and sometimes in the spirit of the sportsman hunting beaver.

Mr. John Cartwright[1] says: "On the part of the English fishers their conduct is an inhumanity that sinks them far below the level of savages. The wantonness of their cruelties toward these poor wretches has frequently been almost incredible." And then he gives the following examples:—

[1] John Cartwright was at this time a lieutenant in the British navy, commanding H. M. Guernsey on this station. He visited that part of the country in 1768, and, as we shall see, made a trip to Red Indian Lake. He has left a small work still in MS. in the Legislative library at St. John's, entitled "Remarks on the situation of the Red Indians, natives of Newfoundland, with some account of their manner of living, together with such descriptions as are necessary to the explanation of the sketch of the country they inhabit taken on the spot in the year 1768." He was accompanied by his brother George, who has given similar information in his work, "Explorations in Labrador."

"One day a small family of Beothiks was surprised in their wigwams by a party of fishermen. On the appearance of their foes the Indians fled in consternation, all except one woman, who, being unable to follow her companions, gave herself up as a prisoner, endeavouring by signs, especially appealing to the indications of approaching motherhood, to implore mercy from her captors. Her gesticulations and entreaties were in vain. One of the wretches, by a well directed blow with his knife, ripped open the body of the unhappy woman, and in a few minutes she expired in agony at his feet. Not content with murder, the monsters proceeded to mutilate the body in a barbarous manner, and on their return boasted of what they had done, exhibiting in triumph the hands of their victim, which they had cut off and retained as a trophy." Again, "some fishermen, as they doubled in their boat a point of land, discovered a single, defenceless woman, with an infant on her shoulders. One of them instantly discharged at her a very heavy load of swan shot, which lodged in her loins. Unable now to sustain her burden, she unwillingly put it down, and with difficulty crawled into the woods, holding her hand upon the mortal wound she had received, and without once taking her eyes off the helpless object she had left behind her In this dreadful situation she beheld her child ravished from her by her murderers, who, seeing two Indians on a height at some distance, beat a hasty retreat to their boat." This was in August, 1768, the very month in which Mr. Cartwright set out on his journey to the Red Indian Lake. The man brought the child to him, and telling what he had done, with as much insensibility as he would the killing of a beast of prey and the capture of its young, asked a reward, as if his conduct would be pleasing to the governor. This child was carried to England, and the next winter was exhibited in the western towns of that country for two pence a view.

Mr. George Cartwright says that "formerly a very beneficial barter was carried on in the neighbourhood of Bonavista by some of the inhabitants of that bay; that the whites used to carry out goods and leave them at a spot within reach of the Indians, who came and took them, leaving furs instead. But this was broken up by a white wretch lying in ambush, and, when a woman was seen helping herself, shooting her dead. Such was the state of feeling at this time that both brothers say they met men who told them that they would sooner kill an Indian than a deer. "For a period," says Rev. Mr. Pilot, "of nearly two hundred years this same kind of barbarity continued, and it was considered meritorious to shoot a Red Indian. To go to 'look for Indians' came to be as much a phrase as to 'look for partridges.' They were harassed from post to post, from island to island, their hunting and fishing stations were unscrupulously seized by the invading English. They were shot down without the least provocation, or captured to be exposed as curiosities to the rabble at the fairs of the western towns of Christian England at twopence a-piece."

This state of things continued till well into the present century. Not many years ago there were still living on the north-west coast men who had been in the habit of boasting of the number of "head of Indians" they had killed, the record of such being scored on their gunstocks. Tradition, seemingly well founded, has even preserved the name of one woman famed for her skill with the gun, which she employed on a seal in the harbour or a Red Indian lurking on the shore with about equal compunction. George Cartwright also mentions that when the whites came upon any collection of their provisions, canoes and implements, in consequence of the Indians being obliged to make a pre-

cipitate retreat, they were in the habit of destroying the whole, and that in consequence whole families had perished from famine. Need we wonder that there was excited in them the spirit of relentless retaliation; that, driven from their fishing-grounds on the shores, their kinsmen shot down like wild beasts, and urged by hunger to visit the neighborhood of the whites, they not only stole but stealthily let fly their arrows at their inhuman foes. Still it must be noted that there is no such record of cruelties practised by them on the white settlers, as is found in almost all the cases of the settlement of white men among the Indians in America. Nor can we be surprised that when at length honest attempts were made for the restoration of friendship, they had acquired an utter distrust and abhorrence of the signs of civilization, and were animated by a spirit of inexorable revenge against all white men.

IV.

Attempts to Open Intercourse.

We come now to notice the well meant efforts on the part of the authorities and humane individuals to open intercourse with them and to promote their welfare. The British Government, upon representations made of the state of things described, was led to take the matter up. Doubtless under its instructions, proclamations were issued by successive governors for the protection of the natives. The first of these, issued by Capt. Palliser in the year 1760, is the first official document in which the natives are recognized, and seems to have been the model of subsequent ones. It sets forth that His Majesty has been informed that his subjects in Newfoundland "do treat the savages with the greatest inhumanity, and frequently destroy them without the least provocation or remorse. In order therefore to put a stop to such inhuman barbarity, and that the perpetrators of such atrocious crimes might be brought to due punishment, His Majesty enjoined and required all his subjects to live in amity and brotherly kindness with the native savages," and farther enjoined all magistrates to "apprehend persons guilty of murdering the native Indians and send them to England for trial."

In the same year in which the first proclamation was issued, one Capt. Scott and some others went from St. John's to Bay of Exploits, with the view of opening communication with them, whether by appointment of government or as a private adventure we are not informed. At all events, on arrival they built a residence much in the manner of a fort. Some days after a party of Indians appeared and halted near the place. Scott proceeded unarmed to them, contrary to the advice of his people, shook hands with them and mixed among them. An old man, who pretended friendship, put his arms round Scott's neck, when another treacherously stabbed him in the back. The warwhoop immediately sounded, a shower of arrows fell upon the English, which killed five of them, and the rest fled to their vessel, carrying off one of those who had been killed, with several arrows sticking in his body.

The next attempt to open intercourse with them was by Mr. John Cartwright. He was the first European, so far as known, who succeeded in reaching the Red Indian Lake. From his work we learn that the journey was undertaken "with a design to explore the unknown interior parts of Newfoundland, to examine into the practicability

of travelling from shore to shore across the body of the island, and to acquire a more certain knowledge of the settlements of the Red Indians, as well as to surprise, if possible, one or more of these savages for the purpose of effecting in time a friendly intercourse with them"—a tribe, as he observes, with whom, though the original native inhabitants of a country so long in our possession, we hold no intercourse whatever, "except, indeed, the unfriendly one of reciprocal injuries and murders." The expedition, though not a government one, seems to have been undertaken with the countenance of the governor. At Indian Point, on Notre Dame Bay, he met a young Beothik who had been captured when a boy, and was named William June from the month in which he was taken. He was the first of the tribe ever known to have lived among the whites. He is spoken of as "John Cousins' Indian boy." He gave the party information regarding the situation of the Red Indian Lake, which was the principal seat of the tribe, and also in part its configuration, describing a cove in which his father's camp was situated.[1]

Cartwright's company consisted of himself and brother, Rev. Neville Stow, chaplain, and nine seamen of H. M. S. Guernsey, Mr. John Cousins and a servant. They started from Indian Point on Notre Dame Bay on the 24th August, 1768, and pulled a short distance up the River Exploits to a place named Start Rattle.[2] Here they left their boats and began their search along the banks of the river. Before long they came upon wigwams recently erected "and other apparatus." These were so numerous as to indicate that the Indians could not be very far off, and to excite high hopes of soon meeting them. As they advanced their attention was particularly struck by the extent of their fences for taking deer. We have already alluded to the vast herds of these animals, which then ranged the interior. The River Exploits lay right across their course, and in their spring and autumn migrations they crossed it in thousands. In order to capture them the Beothiks had made fences along its bank so high and strong that the largest deer could neither jump over nor force a way through them. These fences were made by felling the trees near the river's bank, without chopping the trunks quite asunder, taking care that they fell parallel with the stream, each being guided so as to fall on the last. Gaps were filled in by stakes or by branches interwoven. These fences were thus raised to the height of six, eight or even ten feet, according to the ground. In places where the trees grew too stunted, or were too scattered to be available for fences, they placed "sewels."[3] These were made by attaching tassels of birch bark to thin sticks about six feet long, which were stuck into the ground ten or twelve yards apart, and so slanting that the rind might hang clear of its support, and thus fluttering with every breath of wind frighten and turn back these timid animals. The most favourable situation for taking them was where there was a beach of about twenty feet wide with a steep bank alongside. At such or other favourable points were placed half-moon breast works, from which to shoot the animals, or probably in other instances they speared them in the water from

[1] We know little more about this boy. A Mr. John Bland of Bonavista, in answer to some enquiries made by Admiral Waldegrave on his becoming governor in 1796, says that he became expert in all the branches of the Newfoundland business; that he was then dead long ago, that an old man informed him that he frequently made visits to his friends in the interior of the country. (Pedley, 184.)

[2] Rattle is used in Newfoundland to denote a rapid.

[3] This word in Old English is defined to mean a "scarecrow," made of feathers tied to a string, hung up to prevent deer from breaking into a place. Virgil refers to the same practice (Geor. iii., 371) "Puniceæve agitant pavidos formidine pennae."

their canoes. These seem to me the most remarkable of the works of the Beothiks. This mode of capturing deer was practised among several tribes of the aborigines of this continent. But I have never known of its being practised on so large a scale. The fences described by John Cartwright extended for thirty miles along the river, and in addition George mentions that on the north side of the river they had erected lines of fences running back from the river, sometimes parallel with each other, or slightly diverging, and forming a narrow lane of some length, and then forming wing fences to the northeast and the northwest. Mr. Cormack, sixty years after, observed the same and remarked the skill with which they were laid out to guide the creatures to certain passes, such as the extreme ends of lakes which form branches of the river, or along the bottoms of valleys between high and rugged mountains, or to fords in the river. Mr. N. R. Neilson, a gentleman employed in lumbering on the Exploits River, mentioned the same to me, and says that some of the old fences have been repaired by the Micmacs. Farther Mr. Lloyd, who visited the district in 1874, observed the remains of an extensive structure of the same kind on the north side of Red Indian Lake. Mr. W. G. Bradshaw, employed about the same time on the geological survey of the island in that quarter, informs me that he observed the same; that wherever there were bogs the stakes remained standing. They were both informed by the Micmacs that this extended northeasterly all the way to Grand Pond,[1] a distance of thirty-five miles. The construction of such works in the circumstances of this people, even with the aid of all the iron axes we may suppose them to have stolen from the whites, must have required the labours of a large number of men, Mr. Cormack says some hundreds, and shows that they must have been a numerous tribe, as well as possessed of a spirit of perseverance and a capacity for harmonious and combined effort.

After six days' travel Cartwright and some of the party reached the lake. They found here a number of the native dwellings, but saw none of their occupants, and their supplies being reduced they returned to the coast. He, however, carefully examined their houses, canoes, etc., and has given us a very carefully written account of them, which, as not only the oldest but the best that we possess, we shall draw upon largely.[2] Their houses were of two kinds. The one called *meotick* was like the ordinary wigwams of the Micmacs and other neighbouring tribes, being a conical hut, formed by a row of poles stuck in the ground in a circle and meeting in a point at the top, and covered by birch rind laid sheet upon sheet like tiles. But one remarkable peculiarity he observed was that in a circle round the centre where the fire was placed were dug oblong hollows, which were lined with the tender branches of fir and pine, and which he supposed were their sleeping places. This kind of nest in the wigwam was almost peculiar to the *Beothiks*. But Lady Blake mentions that among a tribe at the foot of the Rocky Mountains named the Atnaks, whose lands are contiguous to the Thompson River, the women dig out holes on the ground, which they inlay with grass or branches, and which it is supposed are used as places of repose.

The other form of dwelling was the square-framed habitation, the *mammateek*, as it

[1] In Newfoundland lakes of whatever size are called ponds.

[2] Mr. George Cartwright, in his "Journal of Transactions and Events on the Coast of Labrador," has given an account of the same journey and similar particulars about the Red Indians. We have added some items from his work.

was called. "It was about ten or twelve feet square, and substantially built of timber, nearly in the fashion of the English fishing houses, only that the studs were something apart, from which it was evident that they alone could not in that state form the shell as in the English buildings, where they are closely joined together. But within this and parallel to it, there was another frame of slighter workmanship, a sort of lattice work, rising to the roof. From the hair which adhered to the studs, the interval appeared to have been filled with deer skins, than which there could have been nothing better calculated for keeping out the cold. This was the construction of only three sides, the fourth being raised by trees well squared and placed horizontally one upon another, having their seams caulked with moss. The difference was probably owing to a deficiency of skins, and the rather so as this inferior side of the dwelling bore a southeast aspect, which required less shelter than any other. The lodgments of the rafters on the beams and the necessary joints were as neatly executed as in the houses commonly inhabited by our fishers. The roof was a low pyramid, encompassed at the distance of three feet from its vertex by a hoop tied to the rafters with thongs. Here the covering had terminated, and the space above the hoop had been left open as in the wigwams for a passage to the smoke, the fire place having been in the centre."

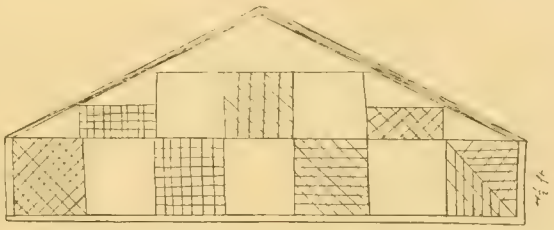

Fig. 1. *Red Indian store house, as drawn by Shanandithit.*

Such a form of residence is very unusual among the wandering Indian tribes of Northern America. The birch or skin-covered tent, so easily erected and so easily removed, is so admirably adapted for a nomad people that it is rare to find them adopting this more permanent form of dwelling. Whether the Beothiks had it originally or imitated the whites in its construction, it indicates progress toward a more settled condition of life. Besides these they had large store-houses said to have been from thirty to fifty feet long and nearly as wide. (Fig. 1.) In these they laid up their supplies for the winter. Besides the venison which we have mentioned, Mr. George Cartwright says that they found in them seal's flesh, birds and fish, and a kind of sausage, "consisting of the flesh and fat of seals, eggs and a variety of other rich matter stuffed into the entrails of seals. For want of salt and spices the composition had the *haut gout* to perfection." Shanandithit, a native woman to be noticed hereafter, made a sketch of the inside of one of these, representing it as hung round with "different kinds of animal food," dried salmon, dried meat, lobsters' tails dried, pieces of seal's fat on the skin, bladders filled with oil, etc. It is also said "that they had an ingenious way of keeping venison fresh." They first cut it into thin strips, and after having taken out the veins and sinews and washed away the blood, they packed it in alternate layers of meat and melted tallow in a casing of birch bark, which they bound up tightly, thus forming an hermetically sealed mass.[1]

[1] This seems to be simply the pemmican of the West.

Of their canoes he gives an exact account. "The principle on which the Red Indian canoe is constructed is, perhaps, nowhere else to be met with. It has in a manner no bottom at all, the sides beginning at the very keel, and from thence running up in a straight line to the edge or gunwale. A transverse section of it at any part whatever makes an acute angle, only that it is not sharpened to a perfect angular point, but is somewhat rounded to take in the slight rod that serves by way of keel. This rod is the thickest in the middle (being in that part about the size of the handle of a common hatchet), tapering each way and terminating with the slender curved extremities of the canoe. The form of this keel will then, it is evident, be the same as the outline of the long section, which, when represented on paper, is nearly, if not exactly, the half of an ellipse longitudinally divided. Having thus drawn the keel, whose two ends become also similar stems to the canoe, the side may be easily completed after this manner. Perpendicular to the middle of the keel, and at two-thirds the height of its extremities, make a point. Between this central and the extreme points describe each way a catenarian arch with a free curve, and you will have the form of the side, as well as a section of the canoe. The coat or shell of the canoe is made of the largest and fairest sheets of birch rind that can be procured. Its form being nothing more than two sides joined together where the keel is to be introduced, it is very easily sewed together entire. The sewing is perfectly neat and performed with spruce roots split to the proper size. That along the gunwale is like our neatest basket work. The seams are payed over with a sort of gum, appearing to be a preparation of turpentine, oil and ochre, and which effectually resists the water. The sides are kept apart, and their proper distance preserved, by means of a thwart of about two fingers substance, whose ends are lodged on the rising points above mentioned in the middle of the gunwale. The extension used when this thwart is introduced lessens in some degree the strength of the canoe by drawing in still more its curling ends. It also fixes the extreme breadth in the middle, which is requisite in a vessel having similar stems, and intended for advancing with either of them foremost, and by bulging out its sides gives them a perceptible convexity much more beautiful than their first form. The gunwales are made with tapering sticks, two on each side, the thick ends of which meet on the rising points with the ends of the main thwart, and being moulded in the shape of the canoe, their small ends terminate with those of the keel rod on the extremities of each stem. On the outside of the proper gunwales, with which they exactly correspond, and connected with them by a few thongs, are also false gunwales fixed there for the same purpose as we use fenders. The inside is lined entirely with sticks two or three inches broad, cut flat and thin and placed length-ways, over which others again are crossed, that being bent in the middle extend up each side to the gunwale, where they are secured, serving as timbers. A short thwart near each end to preserve the canoe from twisting, or being bulged more open than proper, makes it complete. It may readily be conceived from its form and light fabric that being put into the water it would lie flat on one side, with the keel and gunwale both at the surface. But being ballasted with stones it settles to a proper depth in the water and then swims upright, when a covering of sods and moss being laid on the stones the Indians kneel on them and manage the canoe with paddles. In fine weather they sometimes set a sail on a very slight mast fastened to the middle thwart. But this is a practice for which these

delicate and unsteady barks are by no means calculated. A canoe of fourteen feet long is about four feet wide in the middle.[1]

Fig. 2. Red Indian Canoe, with a section midships, from a sketch by John Cartwright.

Mr. Cartwright has given us a small drawing of one of these canoes, which we reproduce. (Fig. 2.) Each tribe of Indians has its own pattern of canoe, as well as of snowshoes and other articles. The difference is generally a matter of fancy, but where it is important we will generally find that it has been adopted to suit the difference of circumstances. Thus among the Crees in the West, where their navigation is largely of rivers in which are many rapids, their canoes are constructed with a high prow, serving to prevent the taking in of water to which they would be liable in such cases. But among the Micmacs and other eastern tribes, where their navigation is principally on the even surface of rivers and harbours, their canoes have their gunwales continued straight or with a gentle sweep from end to end The Beothik canoe resembled the Cree in having the prow rising upward, but it rose much higher and narrowed to a point, instead of curving backward, as with the latter. I have no doubt that this form would render it less liable to ship a sea, while the construction of the hull, when properly ballasted, would increase its capacity as a sailing craft among the rough waters of the Newfoundland coast. But the V shaped hull is something singular. So far as I am aware, nothing is to be found like it among the tribes in northern America. With them I believe the universal practice is to have their canoes with bottoms either flat or slightly convex. But from its greater depth this would take a greater hold of the water.

As to sails archæologists are disposed to regard the aborigines of America as ignorant of their use. I have seen it stated that the Peruvians were the only people of America who used them. To me it seems impossible to believe that tribes in whom the powers of observation were so carefully cultivated, who were so acquainted with the powers of nature around them, and who felt the force of the wind every day, should never have thought of employing this mode of propulsion. There is evidence that the Micmacs used a bush in their canoes for the purpose,[2] and Cartwright was not likely to be misinformed in his statement regarding the Beothiks using a mast and sail. At all events George Cartwright describes them as most expert in the management of their canoes. Their seamanship was evinced by their visiting Funk Island, a small and low-lying island forty miles from the nearest point of land. This island was long distinguished for the number of birds that frequented it. According to Mr. C. the Beothiks visited it once or twice a

[1] Mr. Cormack measured one and found it twenty-two feet long. A family in Notre Dame Bay who had a good deal to do with the Red Indians informed Mr. Lloyd that the thwarts could be taken out and the two sides brought together like a cocked hat. This would be for convenience in carrying them. Even according to Cartwright's description this is possible, but we think it very doubtful.

[2] Hence the proverb common in Nova Scotia, particularly among the young, "too much bush for a small canoe."

year, and returned with their canoes laden with their flesh and eggs. This is confirmed by the fact of their implements having been found there in recent times.[1]

"Their bows," he says, "are of sycomore, which being scarce in this country, and the only wood it produces that is fit for this use, it thence becomes valuable. The sticks are not selected with any such nicety, some of them being knotty and of a very rude appearance, but under this simple rustic guise they carry very great perfection, and to those who examine them with due attention, admirable skill is shown in their construction. Except in the grasp the inside of them is cut flat, but so obliquely and with so much art, that the string will vibrate in a direction coinciding with the thicker edge of the bow. They are full five and a half feet long. The arrow is made of well seasoned pine, slender, light and perfectly straight, and about three feet long." Its head was made at this time of nails or other pieces of iron filched from the whites. It was let into a cleft on the top of the shaft and secured there by a thread of deer sinew. The stock was about three feet long. It was feathered with the pinions of the goose or the eagle. It is uncertain what wood he refers to as the sycamore, as that tree does not grow on the island, nor does the maple, except a dwarf species. Though he speaks of the roughness of their bows, one in the public museum is extremely well made. The string is a very fine piece of twisted deer skin. Mr. George Cartwright says: "They are excellent archers, as many of our fishermen have too fatally experienced."

Mr. C. gives an interesting account of their mode of life at that time. With the first frost and snow the deer commenced to travel southward, collecting together in large droves. If the frost continued they travelled on night and day without stopping to eat, more than snatching some browse or moss as they passed. In this event the Indians at their deer fences would in a very few days kill enough to supply themselves with venison the whole winter. If there came a thaw the deer lingered to feed, resuming progress when the frost returned. In this case the supply was longer in being collected, but was not less certain and abundant. Thus supplied they spent their winter on the banks of the Exploits or the Red Indian Lake, which is an expansion of that river, and Cartwright supposed that they made at least the first part of it a season of merriment.

In spring the deer begin their migration northward, but they are then in miserable condition, and travel slowly in small bands and staying to feed to recover flesh and strength. In spring therefore food became scarce, and the Beothiks moved down to the sea coast, and spent the summer among the islands and bays near the mouth of the River Exploits, extending from Cape Freels to Cape John. They had formerly gone much further, but with their reduced numbers they were now confined to that region. Between these bounds there were hundreds of islands, abounding in sea-fowl, ptarmigan,[2] hares and other game, besides their waters containing seals in great abundance. On the largest of these isles were deer, foxes, bears and otters. Besides hunting all these, they used to kill considerable quantities of salmon in the rivers. But the English, he says, have only left them possession of Charles's and another brook. During the egg season they were supposed to feed luxuriously, and by no means to want after the young have taken wing, for

[1] Here the Great Auk was found in abundance. Recent examination has shown that the natives in visiting the island had used its flesh for fuel.

[2] We have used the name generally employed, but the bird referred to is properly the willow grouse (*Lagopus albus*).

in archery they have an unerring hand. Besides providing for the present, they laid up supplies for the winter.

Their life here, however, as he describes it, was that of a hunted wild beast. "From the time of their coming down to the coast," he says, "they are obliged to observe all the vigilance of war. Few in numbers, and in dread of the firearms of the whites, their life is one of constant alarm. It being necessary to separate into small families to obtain subsistence, renders them an easy conquest to a single boat's crew. There is no codfishery, and consequently there are no inhabitants within the very exterior verge of these islands, but they are often visited by boats that carry the salmon-fishers, shipbuilders, sawyers, woodmen and furriers, as well as by such as row from isle to isle in quest of game. The Indians, from their secret haunts, let not a motion of all these people escape them. They are careful to post themselves where they can command a view of all approaches and secure an easy retreat. Their wigwams are frequently erected on a narrow isthmus, so that their canoes may be launched into the water on the safe side, wherever an enemy's boat appears.[1] Both day and night they keep an unintermitting lookout, so that to surprise them requires uncommon address and subtlety. Even to gain a sight of them is no small difficulty, as they seldom fail to discover the advances of the fishermen early enough to make their retreat without being perceived. This is known to everyone who has traversed these islands to any extent, as the traces of Indians are found wherever they land, and sometimes such fresh signs of them as show that they have not quitted the spot many minutes, and though these appearances may be observed every day, yet whole seasons sometimes elapse without any Indians being seen by them.[2] They cannot be too watchful, for surprises in their wigwams generally prove fatal, and upon sudden accidental meetings it has been the usual practice of the fishermen to destroy them unprovoked, while, terrified, they have attempted nothing but to make their escape."

As to their numbers at that time, the people in that quarter estimated them some at two hundred and others at three hundred. But Mr. Cartwright thought that they might amount to two hundred more. The reason why the residents estimated them so low was that they were so seldom seen, and that only between Cape Freels and Cape John. But he justly remarks that between these two boundaries is a distance of thirty leagues, in which there would be an island for every man, and nearly twenty capacious bays and inlets deeply indenting the land. It was no wonder therefore that they could conceal themselves. His principal reason, however, for his estimate was the number of dwellings he found on the Exploits River and at the lake, and he believed also that they were to be found on some of the neighbouring streams. But in the number of decaying wigwams he had painful evidence of the decrease in their numbers. At what he calls June's Cove, from its having been described by June, the Indian lad, as the site of his father's lodge, "there was a level space reaching within a quarter of a mile within the beach that was cleared of timber and covered with old marks of an Indian settlement now gone entirely to decay."

It may be mentioned that the child whose mother was killed, as mentioned on page 131, was supposed to have been about four years of age at the time of his capture. He

[1] This is confirmed by their remains having been found on such positions.

[2] George Cartwright says: "I met with wigwams upon several of these islands in which the fires were burning, yet I never saw an Indian."

received the name of John August from the month in which he was taken. Till his death he lived among the whites. Mr. Bland, in the letter already quoted, says: "He was taken when an infant. He fell from his mother's back, who was running off with her child when she was shot, and I have been told by those who were intimate with him that he has frequently expressed a wish to meet the murderer of his mother, that he might avenge her death." Mr. Tocque mentions that in 1842 he met an old man who had seen both him and June, when he was a boy at Catalina, and said that August went master of a fishing boat out of that place for several years. All that we know farther of him is contained in the following entry in the parish register of Trinity:

"1788 October 29

"Interred John August, a native Indian of this island, a servant to Jeffrey G. Street."

Mr. Cartwright brought under the notice of the governor, Sir Hugh Palliser, the cruelties practised by the whites in the northeast part of the island upon this unfortunate people, but for a time no active measures were adopted to suppress them. And what cared the lawless trappers and fishermen of that region for proclamations, which were followed up by no practical measures. The relation between the two therefore continued as before till the arrival of Admiral Lord Gambier as governor in 1802. He interested himself in the matter, and among his first acts was the issuing of a proclamation offering a reward for the capture of a Red Indian. As a result a woman was brought to St. John's by a fisherman, of which we have the following record under date 17th September, 1803: "William Cull having brought an Indian woman from Gander Bay to this harbour, I have for his trouble, loss of time, etc., paid him the sum of fifty pounds. The said William Cull has also promised to convey the woman back to the spot from whence she was brought, and to use his endeavours to return her to her friends among the Indians, together with the few articles of clothing which have been given her." She is said to have been taken by Cull as she was paddling in a canoe towards a small island for birds' eggs. She was treated kindly in St. John's, and her appearance and conduct while there are thus described: "She appeared to be about fifty years of age, very docile, and evidently different from all the tribes of Indians or savages of which we have any knowledge. She was of a copper color, with black eyes and hair like the hair of a European. She showed a passionate fondness for children. Being introduced into a large assembly by Governor Gambier, never were astonishment and pleasure more strongly depicted in a human countenance than hers exhibited. After having walked through the room between the governor and the general, whose gold ornaments and feathers seemed to attract her attention in a particular manner, she squatted on the floor, holding fast a bundle in which were her fur clothes, which she would not suffer to be taken away from her. She was then placed in a situation from which she had a full view of the whole room, and on the instant lost her serious or melancholy deportment. She looked at the musicians as if she wished to be near them. A gentleman took her by the hand, pointing to them at the same time. She perfectly understood his meaning, went through the crowd, sat with them for a short time, and then expressed in her way a wish to retire. She was everywhere treated with the greatest kindness, and appeared to be sensible of it. Being allowed to take in the shops whatever took her fancy, she showed a decided preference

for bright colors, accepted what was given, but she would not for a moment leave hold of her bundle, keenly resenting any attempt to take it from her." [1]

Cull, as appears from the above record, was to return her to her friends. As a conciliatory present to them, there was entrusted to him a quantity of goods to the value of seventy-five dollars, consisting of fishing lines, handsaws, hatchets, nails, clasp-knives, blankets, women's shoes, etc. There is reason to believe that the entrusting a Beothik with such an amount of goods to the care of one of the north Newfoundland fishermen, one, too, reported to have shot several of the tribe, was simply entrusting the sheep to the care of the wolf. At all events the arrangements for her return to her people were not immediately carried out, and she remained with her captor all winter. All that is recorded of her afterward is contained in the following letter, dated Fogo, September 27, 1804:—

"SIR,—This is to inform you that I could get no men until the 28th day of August, when we proceeded with the Indian to the Bay of Exploits, and then went with her up the river as far as we possibly could, for want of more strength, and there let her remain ten days, and when I returned the rest of the Indians had carried her off in the country. I would not wish to have any more hand with the Indians unless you will send round and insure payment for a number of men to go in the country in winter. The people do not hold with civilizing the Indians, as they think that they will kill more than they did before.

WM. CULL.

The tone of this letter is rather suspicious, and many believed that instead of returning her to her friends he had murdered her for the sake of the goods sent with her.

In the year 1807 Admiral Holloway arrived as governor. Before leaving England he had formed a plan for holding intercourse with the natives, which he propounded to Lord Castlereagh in the following terms:—

"To have paintings representing the Indians and Europeans in a group, each in the usual dress of their country. The Indians bringing furs, etc., to traffic with the Europeans, who should be offering blankets, hatchets, etc., in exchange. The pictures to be taken by an officer commanding one of the schooners, to the place usually resorted to by the Indians, and left with a small quantity of European goods and trinkets, and when taken away by the Indians to be replaced by another supply."

The idea was not a bad one. It was exactly what was done, we believe successfully, with the natives of Australia. The plan was approved by the colonial minister; a picture was prepared and sent out with the admiral. In the following year (1808) it was entrusted, with a quantity of other articles, to Lieut. Spratt, who proceeded in an armed schooner to the Bay of Exploits. The picture is described as representing officers of the Royal Navy shaking hands with an Indian chief, a party of sailors laying parcels of goods at his feet, Indians, men and women, presenting furs to the officers, a European and Indian mother looking at their respective children of the same age, and a sailor courting an Indian girl. The expedition was entirely unsuccessful, and Lieut. Spratt, after searching for some time, was compelled by the advancing season to return to St. John's without having seen a single Red Indian, and bringing back the picture and the other goods.

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[1] Anspach's "History of Newfoundland," p. 245.

In the following year (1809) the same officer was ordered to renew the search. Whether he did so, or if he did with what result, does not appear. In the following winter the governor engaged Wm. Cull and six others to go into the interior in search of the Indians. Accompanied by two Micmacs, they started on the 1st January, and proceeded up the river on the ice. On the fourth day, having travelled sixty miles, they discovered a building on the bank of the river, about forty or fifty feet long and nearly as wide. It was constructed of wood and covered with bark and skins of deer. In this building they found a quantity of about one hundred deer, some parts of which, from their extreme fatness, must have been obtained early in the fall. The fat venison was in junks entirely divested of bone, and stowed in boxes made of birch and spruce-rind, each box containing about two hundred weight. The tongues and hearts of the deer were stowed in the middle of the package. The bear venison, or that more recently killed, was in quarters and stowed in bulk, some part of it with the skin on. In this storehouse they saw three lids of tin teakettles, which Cull believed to be the same which had been sent back by him six years before with the Indian woman he had captured. They also found several marten, beaver and deer skins, dressed after the fashion of our own furriers. On the opposite bank of the river stood a second storehouse, considerably larger than the former, but they did not examine it, the ice being broken and the crossing in consequence dangerous. In exchange for some furs they left a variety of European goods. On their way to this storehouse they saw two of the natives, but unfortunately the latter discovered the party and retired. They also saw their fences for capturing deer, to which we have referred. They believed that the residences of the Indians could not be very distant from these magazines. But want of bread and some difference of opinion among the party prevented them from exploring farther.[1]

The following winter (1810-11) afforded one of the most interesting, but one of the most melancholy, narratives connected with this unfortunate people. In summer, the new governor, Sir John T. Duckworth, desirous of carrying out the benevolent intentions of the British Government, issued a proclamation in which, besides enjoining all who might meet the Indians to treat them with kindness, he offered to any person who would establish intercourse with them on a firm and settled basis, the sum of £200 as a reward for the great service he would thereby have rendered to His Majesty and the cause of humanity. It was farther promised to such person that he should be honourably mentioned to His Majesty, and receive from the governor such countenance and further encouragement as it was in His Excellency's power to give. He also made arrangements for an expedition to endeavour to open communication with them. This was placed in charge of Lieut. Buchan, commander of His Majesty's schooner Adonis, who was commissioned to obtain the assistance of Cull and the others who had been employed the previous winter in exploring the country.

Mr. Buchan accordingly went in autumn to the entrance of the river Exploits and there anchored his vessel, which soon became fixed in the ice. On the 13th January (1811) he started for the interior with twenty-three men and a boy of his crew, and with Cull and two others as guides. They met with serious difficulties from the weather and the state of travelling, but pushed on, and on the 18th they saw signs, though not very fresh, of Indians, Indian paths, sites of wigwams and deer fences. On the 22nd, when

[1] The report of the expedition will be found in the appendix to Pedley's work, page 480.

they had travelled some sixty miles, they found a storehouse seemingly newly erected. It was of circular form and covered round with deer skins. Some carcases were left a little way from it. A few miles further they reached the spot where Cull had found the two storehouses, but which were now removed.

The following day, having advanced a few miles farther, Lieut. Buchan came to the conclusion that it was impossible to proceed farther with the sledges. He therefore divided his party, leaving one-half with the stores, and taking four days' provisions with the rest renewed his journey. As they advanced the signs of the recent presence of those whom they were seeking became more apparent, and early on the morning of the 24th they came upon three wigwams, and having surrounded them the inhabitants were at once secured.

"On calling to them within and receiving no answer, the skins which covered the entrance being removed, we beheld a group of men, women and children lying in the utmost consternation. They were some minutes without motion or utterance. My grand object was now to remove their fears, which was soon accomplished by our shaking hands and showing every friendly disposition. The women embraced me for my attention to their children. From alarm they became curious, and examined our dress with great attention and surprise. They kindled a fire and presented us with venison steaks, and fat run into a solid cake, which they used with lean meat. Everything promised the utmost cordiality. Knives, handkerchiefs and other little articles were given to them and they offered skins. I had to regret their language not being known, and the presents at the distance of at least twelve miles caused me much embarrassment. I used my utmost means to make them sensible of my wish for some of them to accompany us to bring up things such as we wore. This they seemed perfectly to comprehend. Three hours and a half having been employed in conciliatory endeavours, and every appearance of the greatest amity existing between us, and considering a longer tarry useless without the means of convincing them further of our friendship, giving them to understand that we were going and indicating our intention to return, four of them signified that they would accompany us. Two of the marines observing this requested to be left behind in order to repair their snowshoes. Most of the party wished to be the individuals to remain. I was induced to comply with the first request, from a motive of showing the natives a mutual confidence. Cautioning the men to observe the utmost regularity of conduct, at 10.30 a.m., having again myself shook hands with all the natives, and expressed in the best way I could my intention to be with them in the morning, they expressed a satisfaction on seeing that two of us were going to remain, and we left them accompanied by four of them."

They travelled on together for about six miles till they reached the place where Mr. Buchan's party had made their fire the night before, when one of the natives whom he regarded as a chief, with one of his men, refused to go further, and took his leave, directing the other two to go on with Mr. Buchan. They did so till they came near the place where the goods had been left, when one of them, seemingly panic-stricken, started to go back, beckoning to his companion to follow him. The latter, however, disregarded his efforts, and, though Mr. Buchan allowed him the opportunity to return, he refused to take advantage of it. About 3 p.m. they arrived at the depot. The Indian started at seeing so many more men, but this was only for a moment, and he soon became pleased with all he

saw. Mr. Buchan made him a few presents and showed him the articles that were to be taken up.

The next morning they set out on their return. The conduct of the Indian continued the same. But on reaching the site of the Indian encampment, to their astonishment they found it deserted. It was evident that the Indians had become alarmed by the return of their three countrymen, who probably told some tale of treachery. As there was no sign of violence, they still hoped for the safety of the marines. The Indian who had accompanied them seemed perplexed at the state of matters. Lieut. Buchan, giving him some presents, desired him to go after his people, trusting that his appearance and recital of the treatment he had received would not only be the means of liberating the men, but also of inducing the natives to return. He, however, refused to leave, and showed every disposition to conciliate his new friends.

Having left presents for the owners of the different wigwams, and attaching some to a red staff about six feet long, which the Indian had given them to understand belonged to the chief, they set out early the next morning to follow the party. The Indian accompanied them, sometimes running on before in a zig-zag direction, keeping his eyes to the ice as having a trace to guide him. When they had gone about two-thirds of a mile from the wigwams, he edged in suddenly, for an instant halted, then took to flight with a rapidity which baffled pursuit. The cause was too soon apparent. The bodies of the two unfortunate marines lay about a hundred yards apart, pierced with arrows in the back, and the heads carried away and no vestige of garments left.

Mr. Buchan thought it his first duty, instead of following them, to return to secure the safety of the men whom he had left where the goods had been placed. Arriving there, and considering the whole situation, that any attempt to secure the persons of any would only result in bloodshed, which would frustrate all future efforts at reconciliation, and also that the weather indicated a rapid thaw, which would render travelling by the river impracticable, he resolved to return to the coast. Setting out immediately, the party arrived safely at their vessel on the 30th.

After the party had recovered from the effects of their first journey, and due preparations having been made, Lieut. Buchan, on the 5th March, set out on a second, with thirty men and provisions for twenty-two days. After starting the weather proved stormy, but on the 13th they reached the circular store house previously mentioned. They found that the natives had been there since their former journey, they had taken all the prime venison away, and there were indications of their having removed deposits of other articles. What struck him most was that the skin covering of the store on the side fronting the river and the inland side were perforated with many arrows. From this he concluded that some of them had taken a station on the bank and had shot their arrows at the store to ascertain whether the white men might not be concealed within it. From the spirit thus manifested and the state of the weather, Lieut. Buchan concluded to abandon any farther pursuit. He accordingly returned to his vessel, and so ended this well-meant attempt to enter into friendly relations with the unfortunate Beothiks.[1]

[1] Full particulars are given in a letter to Lord Liverpool in 1811, most of which appear in the appendix to Mr. Pedley's work, p. 482. Lieut. Buchan may in his circumstances be excused for his course in leaving his men unprotected among them. But in any case it was not to be expected that a people who knew the whites only through a century of murder and treachery, should at once have all their suspicions removed. In this case they saw in his party the very men that they knew to be the most active in shooting them, and is it any wonder that they distrusted a party led by such guides?

It was afterward ascertained that they had suspected that Capt. Buchan had gone to bring up a body of men to make them all prisoners. They had therefore resolved to break up their encampment and to alarm and join the rest of the tribe encamped around the lake. They went first to a point on the north side, where was a small encampment of sixteen souls—five men, four women, three boys and four girls. With these they proceeded across the lake to the south side, where now all that remained of the tribe were encamped. Probably the whole number would not exceed seventy souls, such was the destruction that had been going on. Here they raised the head of one of the marines which they had brought with them on a pole and danced round it for two hours. They remained here till spring, when they returned to their former residence and did the same with the head of the other marine which they had left behind them.[1]

We hear no more of efforts on the part of government to enter into communication with them. Of the relation between them and the settlers we are safe in assuming that it continued of the same hostile character. We next hear of this people in the beginning of the year 1819, when a person of the name of Peyton, carrying on considerable salmon fisheries in the north of the island, having been greatly annoyed and having suffered considerable losses by the depredations of the natives, determined to go into the interior with the view of recovering his lost property and of establishing a system of trade by barter with them. In this journey he was accompanied by his father and eight men, all armed. One the 5th March, on Red Indian Lake, which was then frozen, they surprised three Indians at a little distance from their wigwams. One, who proved to be a woman was captured, or induced to stop, when a man, described as six feet high and of a noble and commanding figure, and who it was ascertained afterward was her husband, turned back and attempted to rescue her single-handed, when he was shot, and it is believed also the third of the party.[2] The woman was taken to Twillingate, where she was placed under the care of the Church of England clergyman of that place. She received the name of Mary March from the month in which she was taken, though her native name was Demasduit. A full account of her was prepared by Capt. Hercules Robinson, of H. M. S. Favourite, from recollection of conversations with the Rev. Mr. Leigh,[3] which we give nearly in full. On the death of her husband he says:—"She did not fly, shed no tears (a savage never weeps), but after a few minutes' violent struggle of emotions, which were visible on her intelligent countenance, anguish and horror appeared to give place to fear, and she went to the murderer of her husband, clung to his arm, as if for protection, and strange to say a most devoted attachment appeared from that moment to have been produced toward him, which only ended with her life.[4] To him alone she was

[1] This information regarding the movements of the Indians, with some to be given presently, was obtained from Shanandithit, a Red Indian woman, whose capture and life among the whites we shall have occasion to refer to at length. The man who accompanied Lieut. Buchan's party back to their supplies was her uncle.

[2] In a vocabulary drawn up by Mr. King, mostly from Mr. Cormack's papers, his name is given as Monosebasset, and he is said to have been 6 ft. 7½ in. high. When or by whom he was measured we are not informed. But there are traditions round the coast of such gigantic men among them. Allowing for exaggerations, there is reason to believe that they were generally a tall race of men.

[3] The MS. of this is in the British Museum, but a copy is in the Legislative Library of Nova Scotia.

[4] Chappell says that in like manner the woman captured by Cull was contented in the presence of females, but became outrageous if a man approached her except Cull, with whom she was gentle and affectionate. I believe the cause of this was the reaction of feeling from expecting to be killed, but instead treated with kindness.

gentleness, affection and obedience, and the last act of her life was to take a ring from her finger and beg that it might be sent to John Peyton." It may be stated here that it was afterward ascertained that she left two children behind her, one of them an infant, which is said to have died a few days after her capture.

"The tribe was in the neighbourhood of this disastrous meeting, and it was necessary that the Peytons should secure their retreat. They had a sleigh drawn by dogs in which she placed herself, when she understood that she was to accompany the party, and directed them by signs to cover her over, holding her legs out to have her moccasins laced, and here and subsequently by her helplessness, by the attention she appeared habitually to expect at the hand of others, and by her [un] acquaintance with any laborious employment, she seemed to have been accustomed to a treatment of female savages very different from that of all other tribes." We doubt Capt. R.'s interpretation of her conduct in this respect, but it was remarked by others that her dignified mien suggested the idea of her being a chief's wife, if not a chief in her own right.

"She was quite unlike an Eskimo in face and figure, tall and rather stout body, limbs very small and delicate, particularly her arms. Her hands and feet very small and beautifully formed, and of these she was very proud. Her complexion, a light copper colour, became nearly as fair as a European's after a course of washing and absence from smoke. Her hair was black," and others say very much like that of a European, " her eyes " black and " larger and more intelligent than those of an Eskimo, her teeth small, white and regular, her cheek bones rather high, but her countenance had a mild and pleasing expression. Her voice was sweet, low and musical.

" When brought to Fogo she was taken into the house of Mr. Leigh, the church missionary, where for some time she was ill at ease, and twice during the night attempted to escape to the woods, where she must have immediately perished in the snow. She was, however, carefully watched, and in a few weeks was tolerably reconciled to her situation, and appeared to enjoy the comforts of civilization, particularly the clothing. Her own were of dressed deer skins, tastefully trimmed with marten, but she would not put them on or part with them. She ate sparingly, disliked wine or spirits, was very fond of sleep, never getting up to breakfast before 9 o'clock. She lay rolled up in a ball in the middle of her bed. Her extreme personal delicacy and propriety were very remarkable, and appeared more an innate feeling than any exhibition of tact or conventional trick. Her power of mimicry was very remarkable and enabled her quickly to speak the language she heard, and before this she could express herself by signs and dumb motions that were curiously significant. She described the servants, blacksmiths, tailor, shoemaker, a man who wore spectacles, and other persons whom she could not name with a most happy minuteness of imitation."

"She would sometimes, though rarely, speak freely to Mr. Leigh, and talk of her tribe. They believe in a Great Spirit, but seem to have no religious ceremonies. Polygamy does not appear to be practised. Mr. Leigh is of opinion that they are about three hundred in number. I forget the data from which he calculates. They live in separate wigwams. Mary's consisted of sixteen. The number was discovered in rather a curious manner. She went frequently to her bedroom during the day, and when Mr. Leigh's housekeeper went up she always found her rolled in a ball apparently asleep. At last a quantity of blue cloth was missed, and from the great jealousy that Mary showed about

her trunk suspicion fell upon her. Her trunk was searched and the cloth found nicely converted into sixteen pairs of moccasins, which she had made in her bed. Two pairs of children's stockings were also found, made of a cotton nightcap. Mr. Leigh had lost one. But Mary answered angrily to all questions about her merchandise, "John Peyton," "John Peyton," meaning that he had given it to her. At last in the bottom of her trunk the tassel of the cap and the bit marked "J. L." were found. When looking steadfastly at Mr. Leigh, she pointed to her manufacture, said "yours," and ran into the woods. When brought back she was very sulky and remained so for several weeks.

"The poor captive had two children, and this was probably the tie that held her to her wigwam, for, though she appeared to enjoy St. John's when she was taken there, and her improved habits of life, she only "dragged a lengthened chain," and all her hopes and acts appeared to have a reference to her return. She hoarded clothes, trinkets and everything that was given her, and was fond of dividing them into sixteen.

"She was very obstinate, but was glad to be of any service in her power if not asked to assist. She was playful and was pleased with startling Mr. Leigh by stealing behind him softly. Her perception of anything ridiculous, with her general knowledge of character, showed much archness and sagacity. She particularly despised bachelors. When she was taken to St. John's, on entering the harbour she said to Messrs. Leigh and Peyton: "You go shore, Mr. Leigh. Mr. Peyton when go shore no *enamoose* (woman) ha ha, ha ha." She was indifferent to music, did not seem to perceive its force, liked exhibiting herself to strangers, and was very fond of putting on and taking off all the dresses, ribbands and ornaments which were given her.

"Mr. Leigh once drew on a bit of paper a boat and crew with a female figure in it going up a river, and stopping a moment at a wigwam, then described the boat freighted as before returning. Mary immediately applied the hieroglyphic and cried out: "No no; no, no." He then altered the drawing, taking the woman out and leaving her behind at the wigwam, when she cried very joyfully: "Yes, yes, good for Mary." A variety of representations more obscure than this she perceived with great quickness, and had much satisfaction in this mode of communication."

To the above Capt. R. appends the following note: "I have written these notes from the recollection of conversations with Mr. Leigh at Harbour Grace during several weeks, and I regret that I neglected to note them before many interesting particulars had escaped my memory."

As it is the above is the fullest description of a Beothik that we possess. Its truthfulness and consequent value are apparent on its face.

Demasduit, as here delineated, is a specimen, but a very favourable one, of a savage, or one brought up apart from civilization. In her self-will, her occasional pettishness and aversion to steady labour we have the faults of such, so like those of children. Her quickness of observation, her reading of character and her power of imitation are the gifts which, being most cultivated among them, become best developed. Her acquisitiveness, which was a feature also of the other females who lived with the whites, can scarcely be regarded as characteristic of the uncivilized, but I scarcely know whether it should be held as evidence of a capacity for civilization. But her modesty and propriety of behaviour, her gentleness and kindness, her gratitude for favours and her affection for her kindred present her in a very favourable light. Indeed, in such respects, she and others

of the tribe that have lived among the whites were very different from the idea we have of savages.

If the interpretation given of her use of the number sixteen be correct, which we see no reason to doubt, then it shows that they had to some extent the communal system of family life. We may add here that, according to all the information that has come down to us, the Beothiks were monogamists and their wives chaste. All the women of the tribe who lived among the whites have been marked by their modesty of demeanour. This has been a distinguishing feature of the Algonkin tribes, and it may indicate some ethnological affinity between them.

Demasduit was taken to St. John's, where she was treated with great kindness, and by her modest and gentle demeanour, as well as her intelligence, she drew much interest towards herself. A miniature of her was drawn by Lady Hamilton, said to be strikingly like her, of which a copy appears in Tocque's "Wandering Thoughts," p. 273, which we

Fig. 3. Portrait of Mary March.

reproduce (Fig. 3). She acquired considerable facility in the use of English, and sanguine hopes were entertained that through her means communication might be opened with her tribe. Her heart, too, was with them in her wigwam on the banks of the Red Indian Lake, where she had left brothers, sisters and children. When therefore the governor appointed Capt. Buchan to the charge of an expedition to take her back and to establish friendly relations with them, it seemed as if a brighter day for this people was dawning, and that they were at last to be introduced to the blessings of Christianity and civilization. It was not to be. She left St. John's with a bad cough, which developed into consumption, and at the mouth of the River Exploits she died on the 8th January, 1820.

This was too likely to increase the obstacles in the way of establishing peaceful intercourse with a race naturally become so suspicious. All that could be done in the way of conciliation was done. Capt. B. had the body wrapped in linen and placed in a coffin. This he left on the margin of a lake in the interior, where it was likely to be found by her people.

It was afterwards ascertained that all that remained of the tribe were that winter

encamped on the banks of the River Exploits. Their numbers had decreased during the few years preceding. Shanandithit drew a pencil sketch of a gun and a puff of smoke to indicate that the shooting was still going on. At this time, according to her statement, they were then reduced to four families—her father's, numbering five, her uncle's, seven, a third nine, and the fourth six, making twenty-seven in all, occupying three camps. They saw Capt. Buchan and his party pass up the river on the ice, but made no sign. They then went down to the seacoast near the mouth of the river, where they remained a month. After that they returned up the river, and saw the tracks of Capt. B.'s party returning. They then went by a circuitous route to the lake, and to the spot where Mary March's body had been left. They opened the coffin with hatchets and took out the clothes, etc., that had been left with her. It was allowed to remain suspended as they found it for one month. It was then placed on the ground, where it remained two months, when in spring they removed it to the house-tomb which they had built for her husband, and laid her by his side.

We hear of no farther contact of the whites with the Beothiks till the winter of 1823, when two men named C—— and A——, near Badger Bay, fell in with an Indian man and woman, who approached apparently soliciting food. The man was first killed, and the woman, who was afterward found to be his daughter, in despair remained calmly to be fired at, when she also was shot through the chest and immediately expired. This was told Mr. Cormack by the man who did the deed.

About a month after, and in the same neighborhood, a Red Indian family was fallen in with by a band of furriers, at the head of whom was Cull, already mentioned. They first saw an Indian man and woman. According to one account the former fled, but the latter approached Cull and his party, and afterward led them to a clump of bushes where her two daughters were, the one aged about twenty, whose native name was Shanandithit, to whom we have already referred. But according to another account as given in the journal of the Rev. W. Wilson, the party had gone two and two in different directions, when one of these bands saw an Indian on a distant hill, and supposing him to be one of their party, they fired a gun loaded only with powder to let their friends know of their whereabouts. A Red Indian generally fled at the report of a musket, but this man only quickened his pace, and came toward them in a threatening attitude and with a large club in his hand. They summoned him to surrender, but he came on with redoubled fury, and when nearly at the muzzle of their guns one of the men fired and he fell dead at their feet. He adds that the men were brought to trial, but there being no evidence against them they were acquitted. From this statement we cannot doubt that the Indian was shot, but it is very unlikely that one man armed only with a club should advance to attack two men armed with muskets. If he did it could only have been from his being in a state of desperation. Mr. Wilson has given the statement of those engaged in the affair, but circumstances now known leave little doubt that they came to solicit food. At all events the three women were captured, and were found to be all seemingly in a starving condition.

From Shanandithit it was afterward ascertained that famine and disease had been doing their deadly work among the feeble remnant of the Beothiks. Of the twenty-seven, three years before, three of the second family, one of the third and two of the fourth had died. They had long been too feeble to keep up their deer-fences, and at their old resorts

food had failed. Driven by hunger, some, perhaps the whole remnant, resolved to risk death at the hands of the whites by going down to the coast, if haply they might prolong life by gathering mussels or other food to be found there. Shanandithit's uncle and his family were among the first to go. But he and his daughter were the parties shot, as we have mentioned,[1] and the two remaining members of the family "afterwards died." Shanandithit's family followed, with the result, as we have seen, that one was killed and three captured. What became of the fifth we are not informed. This would leave only twelve remaining besides him. They are stated to have consisted of five men, four women, one lad and two children, and to have taken their course toward the lake. At all events none of them were ever seen or heard of more, and there cannot be a doubt that they all perished. Indeed, from the state approaching starvation at which they were at this time, it is not likely that any of them survived that spring.

Mr. Peyton brought the three women to St. John's, to receive the reward offered by government for bringing in a Red Indian. The Rev. W. Wilson, who met them and tried to converse with them, says in his journal of them :—

"They were first taken to Government House, and by order of His Excellency the Governor a comfortable room in the court-house was assigned to them as a place of residence, where they were treated with every possible kindness. The mother is far advanced in life, but seems in good health. Beds were provided for them, but they did not understand their use, and they slept on their deer-skins in the corner of the room. One of the daughters was ill, yet she would take no medicine. The doctor recommended phlebotomy, and a gentleman allowed a vein to be opened in his arm to show her that there was no intention to kill her, but this was to no purpose; for when she saw the lancet brought near her own arm both she and her companions got into a state of fury, so that the doctor had to desist. Her sister was in good health. If she had ever used red ochre about her person, there was then no sign of it on her face. Her complexion was swarthy, not unlike the Micmacs. Her features were handsome. She was a tall, fine figure, and stood nearly six feet high, and such a beautiful set of teeth I do not know that I ever saw in a human head. In her manner she was bland, affable and affectionate. I showed her my watch. She put it to her ear and was amused with its tick. A gentleman put a looking-glass before her and her grimaces were most extraordinary. But when a black lead-pencil was put into her hand and a piece of white paper laid upon the table she was in raptures. She made a few marks on the paper, apparently to try the pencil. Then in one flourish she drew a deer perfectly, and, what is more surprising, she began at the tip of the tail. This person, whose Indian name is Shanandithit, is thought to be the wife of the man who was shot.[2] The old woman was morose, and had the look and action of a savage. She would sit all day on the floor, with a deer-skin shawl on, and looked with dread or hatred upon everyone that entered the court-house." It may be added that she continued to show much the same spirit.

Under date June 24th, the same journal has the following references to them :—

[1] It is presumed that he was the same who accompanied Lieut. Buchan back to his supplies.

[2] It has since been said that he was her uncle. But from her statements it appears that her uncle was the man shot just shortly before. We judge this man to have been her father. He was plainly the head of the family.

"Saw the three Indian women in the street. The ladies had dressed them in English garb, but over their dress they all had on their, to them indispensable, deer-skin shawls. And Shanandithit, thinking the long front of her bonnet an unnecessary appendage, had torn it off, and in its place had decorated her forehead and her arms with tinsel and coloured paper.

"They took a few trinkets and a quantity of the fancy paper that is usually wrapped round pieces of linen. But their great selection was pots, kettles, hatchets, hammers, nails and other articles of ironmongery, with which they were loaded so that they could scarcely walk. It was painful to see the sick woman, who, notwithstanding her debility, was determined to have her share of these valuable treasures."

It was found that the youngest daughter was in consumption. The mother also was unwell. It was therefore deemed prudent to hasten their return to their people. This work was entrusted to Mr. Peyton, who was furnished with a large number of presents, consisting of such articles as would be most likely to please them. These he was instructed to use as circumstances and his own discretion might render most suitable as "an incitement to these poor creatures to repose confidence in our people in that part of the coast they frequent."

A vessel was sent to take the women to the place whence they came. The ship's boat took all their things ashore. Then the women went with great reluctance. But when they were landed and the boat was about to leave them, they cried, they screamed, and rushed into the water after the boat. The captain's orders were to put them ashore and leave them. But in the circumstances he felt that this would be cruel. He therefore determined to leave them with the people who had captured them. The sick daughter soon died and the mother did not long survive. Shanandithit stated that the reason they were all unwilling to go back to their own people was that they would be killed as traitors, having been among the whites, but probably they did not wish to go back to the state of misery in which they had left the remnant of the tribe.

In the year 1827 a "Bœothick Society" was formed in St. John's for the special purpose of holding communication with the remnant of the tribe, if still existent, and to do what was possible for their improvement. For this purpose an expedition was organized to traverse that portion of the island, which they had been known to occupy, and was placed under the charge of Mr. Cormack, who had crossed the island in 1822. He accordingly proceeded to the Bay of Exploits, and from his report laid before the Bœothick Society we shall transcribe those portions which bear upon the special object of his journey :—

"My party consisted of three Indians, an intelligent and able man of the Abenaki tribe from Canada, an elderly Mountaineer from Labrador, and an adventurous young Micmac, a native of this island, together with myself."

"On the 31st October, 1827, we entered the country at the mouth of the River Exploits, on the north side, at the branch called the Northern Arm. We took a northwesterly direction, which led us to Hall's Bay, through an almost uninterrupted forest, and over a hilly country in eight days. This tract includes the interior country, extending from New Bay, Badger Bay, Seal Bay, etc., being minor bays branching from Notre Dame Bay, and well known to have been heretofore always the summer residences of the Red Indians.

"On the fourth day after our departure, at the east end of Badger Bay, Great Lake,

at a portage known by the name of the Indian path, we found traces made by the Red Indians evidently in the spring or summer of the preceding year. Their party had had two canoes, and here was a canoe rest, on which the daubs of red ochre and the roots of trees used to fasten or to tie it together appeared fresh. A canoe rest is simply a few beams supported horizontally about five feet from the ground by perpendicular posts. A party with two canoes when descending from the interior to the sea coast, through such a part of the country as this, where there are troublesome portages, leave one canoe resting bottom up on this kind of frame, to protect it from injury by the weather until their return. Among other things which lay strewed about here were a spear shaft eight feet in length, recently made and ochred, parts of old canoes, fragments of their skin dresses, etc. For some distance around the trunks of many of the birch and fir had been rinded, these people using the inner bark of the latter for food.[1] Some of the cuts in the trees with the axe were evidently made the preceding year. Besides these we were elated by other encouraging signs. The traces left by the Red Indians are so peculiar that we were confident those we saw here were made by them.

"This spot has been a favourable place of settlement with these people. It is situated at the commencement of a portage, which forms a communication by a path between the sea coast at Badger Bay, about eight miles to the northeast, and a chain of lakes extending westerly and southerly from hence and discharging their surplus waters into the River Exploits, about thirty miles from its mouth. A path also leads from this place to the lakes near New Bay to the eastward. Here are the remains of one of their villages, where the vestiges of eight or ten mammateeks or wigwams, each intended to contain from six to eighteen or twenty people, are distinctly seen close together. Besides these there are the remains of a number of summer wigwams. Every winter wigwam has close by it a small, square-mouthed or oblong pit dug in the earth about four feet deep, in which to preserve their stores, etc. Some of these pits were lined with birch rind. We discovered also in this village the remains of a vapour bath. The method used by the Beothiks to raise the steam was by pouring water on large stones made very hot for the purpose by burning a quantity of wood around them. After this process the ashes were removed, and a hemispherical frame work, closely covered with skins to exclude the external air, was fixed over these stones. The patient then crept in under the skins, taking with him a birch-rind bucket of water and a small bark dish with which to pour it on the stones, and to enable him to raise the steam at pleasure.[2]

"At Hall's Bay we got no useful information from the three (and three only) English families settled; indeed we could hardly have expected any. For these and such people have been the unchecked and ruthless destroyers of the tribe, the remnants of which we were in search of. After sleeping one night in a house we again struck into the country to the westward.

"In five days we were in the high lands south of White Bay and in sight of the high lands east of the Bay of Islands, on the west coast of Newfoundland. The country south and west of us was low and flat, consisting of marshes southerly more than thirty miles. We looked out for two days from the summits of the hills trying to discover the

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[1] Doubtful.

[2] Lescarbot describes the Micmacs as having the same process, and it is common among many tribes of America. Shanandithit explained that they used it principally with old people for the cure of rheumatism.

smoke from the camps of the Red Indians, but in vain, though these hills command a very extensive view of the country in every direction.

"We now determined to proceed toward the Red Indian Lake, sanguine that at that known rendezvous we should find the objects of our search.

"In about ten days we got a glimpse of this beautifully majestic and splendid sheet of water. The ravages of fire, which we saw in the woods for the last two days, indicated that man had been near. We looked down upon the lake, from the hills at the northern extremity, with feelings of anxiety and admiration. No canoe could be seen moving on its placid surface. We were the first Europeans who had seen it in its unfrozen state.[1] We approached the lake with hope and caution, but found, to our mortification, that the Red Indians had deserted it for some years past. My party had been so excited, so sanguine and so determined to obtain an interview of some kind with these people, that on discovering, from appearances everywhere around us, that the Red Indians, the terror of the Europeans as well as of the other Indian inhabitants of Newfoundland, no longer existed, the spirits of one and all of us were very deeply affected. The old Mountaineer was particularly overcome. There were everywhere indications that this had long been the central and undisturbed rendezvous of the tribe.

"We spent several melancholy days wandering on the borders of the east end of the lake, surveying the various remains of what we now contemplated to be a cruelly extirpated people. At several places by the margin of the lake are small clusters of summer and winter wigwams in ruins. There was one wooden building, constructed for drying and smoking venison in, still perfect, also a small log-house in a dilapidated condition, which we took to have been a storehouse. The wreck of a large, handsome birch-rind canoe, about twenty-two feet in length, comparatively new, and certainly very little used, lay thrown up among the bushes at the beach. The iron nails, of which there was no want, all remained in it. Had there been any survivors, nails being much prized by these people, such an article would likely have been taken out again. All the birch trees in the vicinity of the lake had been rinded and likewise many of the spruce fir.

"Their wooden repositories for the dead are in the most perfect state of preservation. These are of different construction, it would appear, according to the rank of the person entombed. In one of them, which resembled a hut ten feet by eight or nine and four or five feet high in the centre, floored with square poles, the roof covered with the rind of trees, and in every way well secured against the weather and the intrusion of wild beasts, the bodies of two full-grown persons were laid at length on the floor and wrapped round with deer-skins. One of these bodies appeared to be entombed not longer than five or six years. We thought there were children laid in here also. On first opening this building, by removing the posts which formed the ends, our curiosity was raised to the highest pitch; but what added to our surprise was the discovery of a white deal coffin containing a skeleton neatly shrouded in white muslin. After a long pause of conjecture how such a thing existed here, the idea of Mary March occurred to one of the party, and the whole mystery was at once explained.

"In this cemetery were deposited a variety of articles, in some instances the property, in others the representatives of the property and utensils and of the achievements of the

[1] The visit of Cartwright was at this time forgotten.

deceased. There were two small wooden images of a man and woman, no doubt meant to represent husband and wife; a small doll, which we supposed to represent a child (for Mary March had to leave her child here, which died two days after she was taken). Several small models of their canoes, two small models of boats, an iron axe, a bow and quiver of arrows, were placed by the side of Mary March's husband, and two fire-stones (radiated iron-pyrites, from which they produce fire by striking them together) lay at his head. There were also various kinds of culinary utensils, neatly made of birch-rind and ornamented, and many other things, of some of which we did not know the use or meaning.

"Another mode of sepulture which we saw here was, when the body of the deceased had been wrapped in birch-rind, it was, with his property, placed on a sort of scaffold about four feet and a-half from the ground. The scaffold was formed of four posts about seven feet high, fixed perpendicularly in the ground, to sustain a kind of crib, five and a-half feet in length by four in breadth, with a floor made of small square beams laid close together horizontally, and on which the body and property rested.

"A third mode was when the body, bent together and wrapped in birch-rind, was enclosed in a kind of box in the ground. The box was made of small square posts laid on each other horizontally, and notched at the corners to make them meet close. It was about four feet by three, and two and a-half feet deep and well lined with birch-rind to exclude the weather from the inside. The body lay on its right side.

"A fourth and the most common mode of burying among these people has been to wrap the body in birch-rind and cover it over with a heap of stones, on the surface of the earth in some retired spot. Sometimes the body, thus wrapped, is put a foot or two under the surface, and the spot covered with stones. In one place, where the ground was sandy and soft, they appeared to have been buried deeper and no stones placed over their graves.

"Our only and frail hope now left of seeing the Red Indians lay on the banks of the River Exploits on our return to the sea coast.

"Down this noble lake the steady perseverance and intrepidity of my Indians carried me on rafts in four days. We landed at various places on both banks of the river on our way down, but found no traces of the Red Indians, so recent as those seen at the portage at Badger Bay, Grand Lake, toward the beginning of our excursion.

"What arrests the attention most in gliding down the stream is the extent of the Indian fences to entrap deer. It was melancholy to contemplate the gigantic yet rude efforts of a whole primitive nation, in their anxiety to provide subsistence, forsaken and going to decay. There must have been hundreds of Red Indians, and that not many years ago, to have kept up these fences and pounds. As their numbers were lessened, so was their ability to keep them up for the purposes intended, and now the deer pass the whole line unmolested."

Though scarce a hope remained of finding a Red Indian, yet the Bœothick Institute placed the Indians who had accompanied Mr. Cormack on their establishment to be employed in farther efforts for that purpose, and in the following summer sent them on an exploratory journey to the northern parts of the island. They were to proceed in a schooner to Croke Harbour, and there putting themselves in communication with the French commandant, endeavour to obtain information as to the existence of Red Indians in that quarter. If they heard of such they were to proceed to and examine the spot.

If they received no intelligence of them to the north of that point they were to "proceed westwardly into the interior for about twenty miles, thence to take a southerly direction to White Bay; thence passing round the head of White Bay, and thence easterly and southerly in such directions as may appear the best for the object in view through the country toward the mouth of the River Exploits, being careful to examine particularly the whole of the lakes, rivers and country along the route now described, so that the party may be able to give the most unequivocal information that no part of the country have been left unsearched." They proceeded on their mission, but we have no particulars of their journey. The result however was, though there were rumours about the same time of some natives having been seen, to confirm the impression that they had entirely disappeared.

In 1829 Shanandithit died in St. Johns. She lived in Mr. Cormack's house till he left the island in that year, when she was taken into the house of the Attorney-General, Mr. Simms, where every attention was paid to her wants. But consumption, which had proved so fatal to others of her people, brought within the restraints of civilization, claimed her for its prey, and though she had the best medical attendance her strength declined. She was therefore removed to the hospital, where she died on the 6th June. Two days after she was buried in the Church of England graveyard,[1] and so closed one of the dark pages of the progress of man in the new world.

All subsequent explorations of the haunts of this people in the interior have only served to confirm the impression that with her they have passed away forever. Careful search has only found a few of their implements, the mouldering remains of their huts and deer fences and their untended graves. It has been supposed, indeed, that some remnant of them passed over to Labrador and became mixed with the Montagnais or other tribes of that region, and there have been reports of strange Indians having been seen on that coast. Of these appearances, however, the rumors have been very vague, and they are said to have taken place years after the disappearance of the Beothiks. There was nothing to connect them with that people, and nothing has been heard of them since. At all events when we consider what was involved in such a migration, that it would have required the transportation of their canoe or canoes by land and stream for over a hundred miles, and afterward a coast and sea voyage of still greater length, we must conclude that in their circumstances, when last met with, reduced to twelve, or at most thirteen, individuals, of whom not more than six were men, and all in a starving condition, it would be simply impossible. At all events from Newfoundland they have passed away forever. So entirely have they been exterminated that not even a trace of any remnant mixing with other races can be found.

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[1] The following is the record in the parish register: "June 8, 1829, Nancy Shanandithit, æt. 23, South Side (very probably the last of the aborigines), F. Carrington, rector." It is remarkable that all the females of the Beothiks who have lived among the whites have died in consumption. A tendency of this kind has been manifested in other instances of savages changing their old modes of life for those of civilization. Dr. Hind mentions that the Montagnais and other tribes in Labrador, while in the cold, dry air of the interior are healthy enough, but when they come down to the coast with its damp, chilly atmosphere, they immediately become subject to influenza, which very commonly ends in consumption. In the Northwest, I was informed that before the cession of that territory the traders were in the habit of taking Indian women as servants, but that pulmonary disorders were apt to appear among them, which was attributed to the change from a life so much of which was spent in the open air to one in the confined air of the close dwellings of the whites. That this was the real cause appeared from the fact that on the same parties going to their own lodges, through which one would think all the winds of heaven would pass freely, they generally soon recovered.

V.—Remains.

We must now seek to gather such farther information about them as can be obtained from their remains, as found in cemeteries or on the sites of their old encampments, with any additions that can be had from tradition. As to the graves we have given Mr. Cormack's description of them as he found them at Red Indian Lake. He obtained there a number of articles of their manufacture which he took with him to Britain. These graves were modern, but recently others have been found on islands off the coast in situations almost inaccessible, and it is believed that in prehistoric times, before they were driven into the interior, they chose such positions as the last resting places of their dead. Perhaps the most interesting yet known was discovered in the year 1886 on Pilley's Island, near the entrance of Hall's Bay, an arm of Notre Dame Bay. For the following account of its contents I am indebted to the Rev. Dr. Harvey, of St. John's :—It contained two skeletons. Of the one only the skull and a few bones of the leg remain. It is the skull of an adult Beothik and measures twenty-one inches in circumference and thirteen from ear to ear over the crown. Various stone implements were found alongside the bones, stone arrow heads and hatchets, etc.

The other skeleton is nearly perfect. It is that of a Red Indian boy, nine or ten years of age. (Plate XII.) There was with it a small wooden image, very rudely carved and having a covering of birch-rind. We might have supposed that this was a doll, but the fact of such being found in Mary March's grave, one for each of the occupants, indicates that it was a practice among them to bury such with their dead.

The strange peculiarity of the skeleton is the perfect preservation of the skin, which is wrapped like a shroud around the bony structure. It is dark red in colour and shows the bones underneath. The appearance is not unlike that of a mummy. The nails on toes and fingers are perfectly preserved. It lies on its left side, the arms along the sides, with the legs drawn up.

The body had been wrapped in deer-skin, which had been made to fit closely and was neatly sewed together. Attached to this was an ornamental fringe of deer-skin, having fastened to it some birds' claws and about thirty-two small pieces of bone of different shapes, all carved ingeniously. Several small models of canoes showing accurately the shape of those in use by the tribe, were near the skeleton ; also small drinking-cups and vessels, all of birch-bark, and several pairs of small moccasins of deer-skin, the size of a boy's foot of the age of nine or ten. Beautifully-shaped and well-polished arrowheads of slate, a number of toy arrows of wood and a small bow lay around. Another interesting object was a small birch-rind basket, laced close, and containing a piece of dried salmon, the scales being visible, and several dried trout wrapped in separate parcels.

The skull is detached from the body, the vertebræ of the neck having crumbled to dust. How the skin has been preserved is a mystery. Probably this was owing to the dry character of the soil in which it was laid and the free circulation of the air around it, while moisture was excluded by the covering of birch-rind and the deer-skin wrappings. The remains were found in a slight hollow, and a rough wall of stone had been built around it. Over these walls had been placed bent hoops, formed of fir branches to support the outer covering of birch bark, which was sewed together with extreme neatness and would have kept all from the moisture of the atmosphere. This had not decayed.

As there was not a single article giving evidence of any intercourse with Europeans, as is found in later graves, we may conclude that this is prehistoric, possibly more than four hundred years old. It is plain that the deceased must have been the son of a chief or belonged to a family otherwise distinguished, for difference of rank and wealth were found even among this unfortunate people.

Another skull with other remains was found in circumstances so interesting that we shall give the account of the finder, the Rev. Mr. Blackmore, rural dean of Conception Bay. "They were found in the year 1847 on one of the islands forming the Lower Burgeo group, called 'Rencontre.' This island is uninhabited and considerably elevated; difficult also of access in rough weather. It is in a great measure covered with broken fragments of rocks which have fallen from the heights. About half way up the mountain (if I may so term it), and in a hollow formed by a large piece of fallen rock, with every opening carefully closed by small pieces of the broken rock, we found the bones of a human being wrapped closely round with birch rinds. On removing these rinds a quantity of gravel mixed with red ochre became visible, and on removing this we found oblong pieces of carved bone, together with flat, circular stones, some glass beads, two iron hatchet heads, so rusty that we could pick them to pieces, a bone spear head, the handle of a knife with part of the blade still in it, also some flints designed for arrowheads. All these articles were together, and had been placed apparently under or just before the head of the individual buried—all carefully enclosed in the rinds. The skull was that of a full grown male adult, with a very flat crown and large projection behind. The place of interment was singularly wild; high up in a cliff overlooking a little cove facing the open sea, and only accessible on this side in very smooth water. It was discovered by a boy while gathering brushwood. This boy seeing a piece of wood projecting from the rock, pulled at it to add it to his store, and so loosened the smaller rocks and found the cavity with its contents. The head of this stick, which was about four inches in diameter, was ornamented. There were four fragments of sticks, and they must, I imagine, have formed a canopy over the body."

From the implements here found it is evident that the burial took place after they had intercourse with whites, but so early that they still dwelt on the coast hunting the walrus and other inhabitants of the deep, still using their old implements, and there also depositing their dead. The articles found are in the museum of McGill College, Montreal. The most interesting of these are the pendants of walrus ivory and the pierced shells strung together. The first of these were neatly carved, and had holes at the top for suspension.

The pendants of carved bone or walrus ivory are characteristic of the Beothiks. Cartwright observed them in his visit to the Red Indian Lake in 1768. He says: "Some small figured bones neatly carved and having four prongs, the two middle ones being parallel and almost close together, while the outer ones spread like a swallow's tail, have fallen in my way, and from a thong fixed in their handle I have imagined them to be used as amulets." And they are very generally found in graves. As the result of the examination of but a few, nearly two hundred specimens are now in the public museum in St. John's. They all have a small hole at the upper end for suspension. One class are forked, some having two, others three prongs, and a few having two doubled. These are small, most being from one and a-half to two inches, and few exceeding three inches in length. A

number of these are notched or scalloped on the edges. (Plate IX, 1–6.) The majority, however, consist of flat pieces of bone about an eighth of an inch in thickness, from a quarter to seven-eighths of an inch in width at the smallest end to from seven-eighths to over an inch at the widest, and in length from two to four and a-half inches. These are all incised on both sides. But in no case could I see anything like an attempt to present an animal or any other object. The marking consists of lines and angles, forming designs, some of them intricate and showing considerable ingenuity. Scarce two are found alike, and some of the lines are extremely delicate, being not more than a tenth of an inch in length, and yet are cut the exact length and at the right distance from others to suit the design. It is difficult to understand what instruments they had by which they could do work so fine. (Plate IX, 7–13.)

Cartwright's idea that these were amulets has occurred to others. It was the view of a Micmac to whom the pendants from Rencontre were shown. He at once proclaimed the owner a great "witch," and able with such articles to strike his enemy dead. But it is plain that those in the boy's grave had been attached to the border of his robe, and seemed intended for ornaments. This is confirmed by the fact that Shanandithit has drawn a picture of a dancer as in his robe with such ornaments around its lower edge. (See fig. 4.) We cannot suppose that this was their ordinary every-day dress, but

Fig. 4. Indian Dancing Costume. (Fac-simile of drawing by Shanandithit.)

that it would be their dress for ceremonial occasions. This agrees with what we find in the South Seas. Rev. Dr. Geddie gave me what was called "a dancing dress" of the people of one of these islands, which consisted mainly of shells so strung together and suspended as to rattle with every motion of the body. With these are others with teeth like combs, and possibly they were used for that purpose. (Plate IX, 14, 15.) There are also rectangular blocks of walrus ivory, from an inch to an inch and a quarter the one way and from seven-eighths to an inch the other, and from a quarter to three eighths of an inch in thickness. (Plate IX, 16–18.) There are also small diamond-shaped pieces of bone, some about an inch in the longest diameter by five-eighths in the shortest, but most over two inches one way by about an inch the other, and from one-quarter to

five-eighths of an inch in thickness. Both these are incised on the one side like the pendants, with complicated designs and very delicate workmanship. (Plate IX, 19-21.)

The discs of shell strung together are of importance, as they undoubtedly represent the wampum characteristic of the American Indian. Similar ones about $\frac{7}{8}$ of an inch in diameter are in the public museum. But there are there also strings of much smaller ones, just like a string of beads. There is one 21 inches long and another 13 inches. The strings are of deer hide, and the discs are about $\frac{5}{16}$ of an inch in diameter and about $\frac{1}{8}$ of an inch in length. But driven into the interior this people seemed to have been scarce of shell and substituted bone. They seem to have formed them of cross sections of the leg or wing bones of birds; some are even of wood. There are imperfect strings where the discs are much smaller, being about one-eighth of an inch in diameter. (See Plate X.) Mr. Horatio Hale[1] has traced this back to the money of the Chinese, Japanese and other peoples of Eastern and Central Asia, which consists of round pieces of metal strung together by a cord through a hole in the centre. As people pushed forth to the islands of Polynesia they retained the idea, but having no metal, as a substitute they fashioned round discs of shell, which they strung together in the same manner. Strings of this kind were, and among the ruder tribes of the Pacific, I have no doubt, are yet used as a medium of exchange, or, in other words, as their money. The strings that I have described are in appearance exactly the same with some that I have seen brought from the South seas. (Plate X.) Thus the practice must have passed from island to island of the Pacific till it reached the American continent; then traversed it from West to East, till here we find it beyond the continent in our farthest island stretching forth toward the Old World. We should add that from these graves, as well as those seen by Mr. Cormack at the Red Indian Lake, it is plain that they strongly favoured hut or house burial, a practice world wide, manifested in very varied forms from the rude log huts of various Indian tribes and the barrows of Europe to the mounds of Ohio and the pyramids of Egypt. When they were driven into the interior they erected timber huts, probably this being necessary to protect the contents from wild beasts. But previously they seemed to have chosen remote or almost inaccessible islands, probably because from the absence of such creatures a canopy of birch bark might suffice as a covering.

We must, however, notice a remarkable resemblance between their mode of burial, particularly as exemplified in the boy's grave, and what is seen in some very ancient cemeteries in the East. The modern Warka, near Babylon, the ancient city of Nimrod, Erech (Gen. x, 10), and Mugheir, the ancient Ur of the Chaldees, were used as cemeteries, it is supposed, not only during the time of the early Chaldean supremacy, but during the Assyrian and even the later Babylonian period. They now exhibit mounds which on being penetrated are found to be the tombs of generations. Mr. Loftus, on digging into those at Warka, found brick vaults, but mainly coffins, generally of earthenware, which had originally been laid on the ground and others upon them, tier after tier, till their remains are found piled to the depth of thirty and it was thought in some cases sixty feet. These are described as "resembling an oval dish cover, the sides sloping outwards toward the base, which rests on a projecting rim. The dimensions vary from four to seven feet long, about two feet wide and from one to three feet deep. On carefully

[1] "On the Origin and Value of Wampum," in 'American Naturalist,' Vol. 2, xviii, 1884.

removing this cover the skeleton is seen reclining generally on the left side, but trussed like a fowl, the legs being drawn up and bent at the knees to fit the size of the cover. Sometimes the skull rests on the bones of the left hand." With the skeleton were found various ornaments of gold or silver, small drinking vessels, and "*hideous bone figures, probably dolls.*" ("Researches in Chaldea," pp. 201, 210, Am. edition. See also Rawlinson's "Five Great Monarchies," 2 edit, 1-87; Layard's "Nineveh and its Remains," Am. ed. II, 36.) In the tomb above ground, in the posture of the body, in the deposit with it of ornaments, of drinking vessels, and especially of the doll-like images, it is remarkable to find such a correspondence between people so separated in time and territory as the Assyrians and the Beothiks. But is it only a coincidence? Does it not speak of unity of origin, or at least of close relation at some distant date.

The examination of their old camping-grounds has afforded some information of interest. Mr. Lloyd,[1] during two visits to Newfoundland, spent much time in examining such places and gathering such remains as he could find. He found tokens of their presence specially abundant in the region of the bay and river of Exploits. One feature noticeable was a pit or depression marking the site of each camp. Thus at one point at Bonavista Bay he saw two rows of circular pits, numbering thirteen in one and three in the other. They averaged twelve feet in diameter, and were placed at distances ranging from three to twenty-four feet. In depth some were two feet and others only six or seven inches, but all flat at the bottom. Again, at the Red Indian Lake he found a group of twenty-one, and other groups at short distances from it. They were generally ten feet six inches to fifteen feet in diameter. But one that he measured was thirty-three feet. And a Micmac informed him that when his father had hunted over the ground, some years before, there was a house built over it. This, there can be little doubt, was the site of one of their storehouses referred to. It was eight-sided, having a post driven into the ground at each corner to carry a bow frame to support the sides. Another feature of these places was a bank of earth on the one side rising four feet above the bottom of the trench inside. This had once been an embankment round the outside of the cabin formed of earth, sods and moss, probably for greater warmth in winter. Mr. Bradshaw observed the same, and says that the depressions he would compare in form to a soup-plate. At one part of the lake he thought that there would be forty of them.

Mr. Lloyd and others have observed that in some instances the site of these seem sometimes to have been selected with a view to giving them an unobstructed view of the lake, he thinks, the better to observe the approach of the deer. But in other cases, and perhaps here too, their selection was more influenced by the idea of seeking safety from their enemies. He adds that Reuben Souleau, a Micmac, gave him an account of a circular wall of stones about six feet in diameter and four feet high, situated on the side of Birchy Lake in a position which commanded an uninterrupted view both up and down the stream, supposed to have been built as a lookout place.

Mr. Neilson mentioned to me another fact of some interest. To pass the principal rapids in the river required a portage of a mile and a quarter or perhaps a mile and a

[1] The results of his inquiries are given in two papers published in the 'Journal of the Anthropological Institute,' vol. iv, 1874, and vol. v, 1875. Besides his explorations of the sites of their encampments, he had access to Cartwright's work, and had intercourse with members of the Peyton family and others who had been in a position to obtain information regarding the Red Indians.

half. The course of it ran through a marsh, as it is called, or bog, and over some soft ground. But on examination it is found that over all such places they had laid a pavement of stones. Though these must have in some measure sunk in such ground and the moss has partly covered them, yet the sort of causeway which they formed can still be traced. To the least intelligent observer it is manifest that they were placed there by the hands of men. And they have been carried some distance. There is a slaty rock on the river below from which they had taken slabs from two to three feet in length and breadth. It is probable that there was first laid down a layer of poles or brush to support them. This work must have been done after the Beothiks were driven from the coast and obliged to retire to the interior, when their original numbers were reduced.

Another circumstance connected with this place may be mentioned, communicated to me by Mr. Bradshaw. If the lowest of these rapids could be passed in canoes so much of the river immediately above would be navigable that the portage would be reduced to about half a mile. But it is very difficult to do this, as a fall of water comes in from the side and it requires quick and very powerful strokes, especially from the man in the stern, to prevent the canoe from being swung under it. Two of the Micmacs in his employment attempted the passage, but their canoe was caught in the descending water and upset, so that they lost its contents and themselves were in danger in the pool below. In consequence they do not now try it. But they pointed out to Mr. B. the remains of Red Indian encampments just at the foot of the upper rapids, marking that as their point of embarking on the river. From the signs observed they regarded it as certain that that people were in the habit of shooting the lower rapids, and they adduced this as evidence of their superior strength. The point is one on which they could scarcely be mistaken, and it is sufficient to show at least that the Beothiks were most expert canoemen, and perhaps that their canoes were better fitted for such work than those of the Micmacs.

Mr. Lloyd did not find many of their remains at the lake, doubtless from their being covered with vegetation. But at various points on the coast their kitchen middens have been discovered, affording a variety of specimens of their stone implements and other remains of their art. Perhaps the most important find of this kind was made in 1875 on Long Island, Placentia Bay. At the depth of from six to twelve inches beneath the surface, where there had been a stout growth of timber, there was found a quantity of arrow and spear heads, gouges, axes, rubbing and sharpening stones, and a pot shaped out of serpentine. The arrow and spear heads were in every stage of manufacture from the first block rudely shaped out of the raw material to the completely finished implement.

Mr. Lloyd mentions the following additional places where their remains have been found, starting from St. John's northward round the island: Fox Island, Randra Sound, Trinity Bay, Funk Island, Twillingate Island, Notre Dame Bay at Bay of Exploits and Hares Bay, Granby Island and Sops Island White Bay, Conche Harbour, How Harbour, Hare Bay, Bonne Bay, Mouth of Flat Bay Brook, St. George's Bay and Codroy River. These are all on the sea coast. Any sites of the kind inland must be covered with vegetation, but considering how much of the coast is uninhabited and the soil undisturbed, it is probable that there are many more such places. Altogether the indications are that the Beothiks were numerous for an Indian tribe, and that they occupied this region for a lengthened period.

Of the implements thus found the principal are axe and chisel shaped tools of polished

stone, gouges, sinkers,[1] scrapers and arrow and spear heads. I have not observed anything peculiar regarding them except the last. While some of the arrow and spear heads are of hornstone or quartzite chipped, a large proportion are polished. These are of the Cambrian slates common on the island, and are generally brought to a very regular shape, some having both faces ground to form three or sometimes only two sides, others having one face so shaped and the other flat or nearly so. (Plate X, 1, 4.) But a singular peculiarity is seen in two of this kind in the possession of Dr. Harvey, of St. John's, where we have two holes bored near the stem. In the one they are placed side by side, and in the other one above the other. (Plate X, 1, 2.) These would seem to have been for the purpose of attaching them by a string to the shaft. But this would indicate an idea different from that of other American Indians, who were willing to have the arrow head remain in the animal struck when the shaft was withdrawn. But I believe that these were really harpoon heads which they used in spearing the large sea animals, as we shall see presently, intended to be detached when the animal was struck. These holes were made by scratching with some hard pointed instrument longitudinally, and not by a drill, of which, judging by these, we should suppose them ignorant.

Besides these there have been found a number of vessels of steatite, of which an impure variety is abundant in the northern part of the island. In particular, at Fleur de lys, on White Bay, a large vein of it is found exposed in the cliffs, and here have been found the marks of their workmanship. They cut grooves first vertically in the face of the deposit and then across between them. Then by driving in wedges they broke it off in quadrangular blocks, which they afterward fashioned into vessels at their leisure. These were generally shallow, not more than from two to three inches deep, and not more than from three to four inches in length or width in the inside. Some have a small groove in the upper edge, supposed by some to be intended for a wick, and it is thought that they were used as lamps, though probably they were also used for boiling seal's fat in.

A common find is pieces of iron pyrites, a mineral abundant in some parts of the island, which they used for obtaining fire by striking them together, like flint and steel, and Mr. Peyton stated that for tinder they used the down of the blue jay.

According to him the snowshoes of the Beothiks differed in shape from those of all other Indian tribes, being longer and more taper in the afterpart, and resembling an English racket or tennis bat. This caused the front to bend upward with the weight of the body. A board with a hole in it to receive the toes was fixed across the middle of the racket. (Fig. 5.)

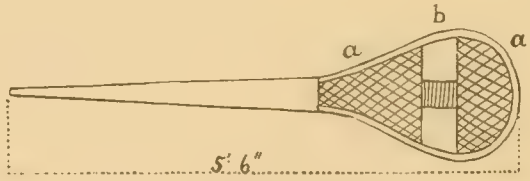

Fig. 5. Red Indian Snowshoe.

Shanandithit made a drawing of some of their implements, the most noticeable of which, perhaps, is their spear or harpoon for killing seals and probably other large marine animals. It had a bone head attached to a shaft twelve feet long, in her time pointed with iron. To this was attached a string, which probably had a float at the other end.

[1] Generally so called, but the purpose for which they were employed is doubtful.

When the animal was struck the shaft would be detached, and the animal going off with the head sticking in him would be checked by the float and gradually exhausted, until it became an easy prey. (See Plate X, 5.) This is the mode of hunting sea animals still followed by the Eskimos and the Indians at the mouth of the St. Lawrence.

VI.—Ethnological Relations.

We come now to consider their ethnological relations. Here our means of investigation are very scanty. No accurate measurements of the bodies of any of them are at hand. It is to be regretted also that so little information has been preserved regarding even the appearance of the few members of the tribe who lived among the whites, and so little learned, by intercourse with them, of their habits and ideas. But it appears that they were of ordinary height, or probably above it. Their hair was coarse and black, and the men allowed it to fall over their faces, though in some it is said to have been as soft as that of Europeans. Their complexion was lighter than that of the Micmacs, which again is (now at least) lighter than that of the western Indians. But this I believe to be simply the result of climate. Of the females who lived with the whites, the appearance seems to have been generally agreeable and their manner gentle and affable. Their dress consisted of two dressed deer-skins, or fur, thrown over their shoulders, forming a sort of cassock, sometimes with sleeves. They had a plan of rendering the deer's skin soft and pliable. Mr. James P. Howley says (Lloyd V, p. 226): "The Beothiks were a much finer and handsomer race than the Micmacs, having more regular features and aquiline noses, nor were they so dark in the skin. They were of middle stature, say five feet ten inches, and of a very active build. They did not appear to be so fond of gaudy colours as their continental neighbours." Mr. Peyton's statement was: "The shape of the heads of males and females did not differ in appearance from those of ordinary Europeans. Their eyes, which did not possess any marked peculiarity of form like those of the Eskimo, were black and piercing."

Cormack, in his account of his expedition across the island in 1822, says: "In former times when the several tribes were upon an equality in respect to weapons, the Red Indians were considered invincible, and frequently waged war upon the rest, until the latter got firearms put into their hands by Europeans. The Red Indians are even feared yet, and described as very large, athletic men." The traditions of the oldest Micmacs, as well as of the white settlers, agree in representing them as physically a large and powerful race.

Only a few skulls have been preserved. Two that were taken to Britain by Mr. Cormack have been very minutely described in a paper by Dr. George Bush, published in the 'Journal of the Anthropological Institute' (v, 230-232). Of one he says, "It is chiefly remarkable for the elevation of the frontal region and the comparatively sparing elevation of the parietal region, which, however, cannot in this case be assigned to an early closing of the sagittal suture. As in the female skull, the occiput is projecting. The chief difference between them is the more upright forehead in the female skull. In both there is no depression at the root of the nose, and in both the nasal spine is very prominent. In both also the greatest width is in the squamosal above the auditory foramen."

Two other skulls are in the local museum, besides one still attached to a skeleton.

They have not been scientifically examined. But on a superficial view they are seen to have some of the peculiarities of the American Indian skull, but to be favourable specimens, having the frontal region better developed than is usual in such.

As to their habits and customs as bearing upon this subject, we are imperfectly informed. No white man ever lived with them so as to become familiar with their daily life, and if the Beothiks who dwelt among the whites gave information on the subject, little has been recorded. In tracing historically the intercourse between the two, we have given such details of their customs as were observed by various parties. But a few points remain to be noticed. In the first place, they never seem to have had any cultivation of the soil. The Algonkins brought with them maize, pumpkins, beans, a species of hemp, and tobacco, and extended the cultivation of these plants up to the St. Lawrence, which is as far as they will grow at the present time. But in Newfoundland maize will not usually ripen, the pumpkin does not flourish, and neither soil nor climate will suit the tobacco. In this way, if they brought these plants with them, they may have been led to abandon their cultivation. But it is quite possible that they may have come by Labrador, where they were not cultivated at all. I am more surprised to find that they had no pottery, as this is found among the rudest tribes in every part of the world, and suitable material is plentiful in some parts of Newfoundland. But not only have no remains of such been found, I think that from the number of dishes found in the boy's grave at Pilley's Island and the abundance of other articles of value to them, we may conclude that if they had earthen vessels they would have been found there.

Cartwright, and most writers who have followed, have described them as without the dog. This is to me quite surprising. The animal is found among most, if not all, the tribes of North America. To hunters it was almost indispensable, and probably, at least in part, for this reason it was connected with their religious services. It was among tribes of different races the animal offered in sacrifice on the most solemn occasions; its flesh formed an important part of the feast for the dead, and its bones were laid in the grave of the departed, that its spirit might aid him in hunting on his long journey. How does it come, then, that the Beothiks were without it? The Micmacs and the Eskimos, on either side, had it. So had the Labrador Indians, with whom they were in friendly relations. Even if they had not brought it with them on their first migration, it seems strange that they should not have acquired it from their neighbours.

I am inclined to believe that there may be something in the statement of old Whitbourne of their having wolves tamed. The dog of the Eskimo is so like a wolf, that Sir J. Richardson mistook a pack of the one for a troop of the other. If the Beothiks had this or even animals like the later Newfoundland dog, he might naturally speak of them as wolves tamed, which he says "hath been well approved" (proved). Martin, in his history of the dog, says that the Norwegians have a dog very like the Newfoundland breed, which they use for hunting bears and wolves, and it is supposed that it was introduced into the island either by the Norsemen in the 11th century, or by Cabot. (Ency. Brit., VII, 324, 327.) In either case it must have been among the aborigines, for there were no other residents. So that if it was either indigenous or introduced thus early, it must have been there among them first. On the other hand, it is strange that if once possessed by them it should have passed entirely from them and come into the hands of their enemies.

One positive fact, however, affords a decisive indication regarding their social connection. It will be recollected that when they killed the two marines of Lieut. Buchan they cut off their heads and carried them away. This shows that they had not adopted the Iroquois practice of scalping, which for a long time was also customary among the Algonkin and other tribes around them. This shows the Beothiks to be a very ancient race and connected with the Malayo Polynesian race, who decapitate their victims taken in war.[1]

Of their religious ideas scarcely any information has been preserved. Old Broughton tells us that they supposed that they sprang from arrows stuck in the ground by the Good Spirit. This seems to be a modification of an idea prevalent among many Indian tribes, of their having originally sprung from the earth, perhaps a distortion of the Scripture teaching that God created man of the dust of the ground. Subsequent writers have generally supposed them to be without any idea of a supreme being. It is certainly strange, that those who had intercourse with those of the tribe who lived among the whites, should have gained no more information for us on the subject. In the vocabularies taken down they have given no name for God, but they have given two for the devil. The one is *Ashmudyim*, which conveys the idea of an ugly black man, and whom Shanandithit described as short and stout, having long whiskers, dressed in beaver skins and sometimes seen at the east end of the lake. The other is *Mandee*, the equivalent of the Micmac Mundou and the Nashkapi Mantuie. But this was originally their name for the Supreme Being, the same as the Manito of the western tribes, and it was only when the Micmacs came under the instruction of Christian missionaries that they came to regard their old god as evil, so that finally his name became associated with the devil. But the Beothiks never met the missionaries and did not associate with the Micmacs, so that they must have used the name in its original sense as denoting their god. And Mary March said distinctly that they did believe in a great spirit.

Cartwright thought it remarkable that in a journey of seventy miles, through the heart of their winter resort, he had not met with a single object that appeared to be devoted to any religious or superstitious purpose, unless it were the carved bones spoken of, which we have seen to have been really ornaments. But we find among them objects to which they seem to have attached a certain sacredness. Lieut. Buchan saw in one of their lodges a peculiar staff. He described it as "nearly six feet two inches in length, at the head tapering to the end, and terminating in not more than three quarters of an inch. It represented four plain equal sides, except at the upper end, where it resembled three rims one above the other, and the whole stained red." It was pointed out as belonging to a man who was distinguished by a high cap, and whom he supposed to be a chief. He concluded that it was a badge of office, but Shanandithit made drawings of some half a dozen of objects resembling wands or sceptres, but one of them with a representation of a vessel on the head of it. These were said to have been about six feet long. (Plate XI.) Mr Cormack has marked them as "symbols of their mythology." But from the representation given of them, and what we know of the customs of other aboriginal tribes, we have no doubt that it was the badge of the authority of the head of the family. Thus Dr. Turner says of the Samoans: "A rod or staff, six feet long, such as is seen on the Egyptian monuments, is *one of the common badges of office of the heads of families* in Samoa, who are

[1] I am indebted to Dr. John Campbell, of Montreal, for first calling my attention to this point.

entitled to speak in public parliament. Every one who stands up to speak leans forward on his staff. Frequently in referring to his speech, he calls it "this staff," and when about to end his address will say: "I am now about to lay down this staff." ("Nineteen Years in Polynesia," p. 341.) The similarity of these implements may indicate an affinity between the Beothiks and the Malayo-Polynesian race, of which the Samoans are among the finest specimens. But the custom really carries us back to patriarchal times, when a rod or staff in the hand of the head of a family or tribe was the symbol of his authority and of tribal unity. Thus Jacob speaks of the sceptre or tribal rod of Judah (Gen. xlix, 10), and in Numbers, xvii, 3, we read of the rod of each of the heads of the father's houses. (See also chap. xxi, 18.) So that the rod came to represent the tribe, and the word is commonly used to denote it. (Exod. xxvii, 21, etc.) So also it pointed out the head of one of the divisions of a tribe, the clan, "family" of our English translation (Hebrew, *mishpachah*), as in Numb. iv, 18, "the tribe (lit. rod) of the families of the Kohathites)." In kingdoms this became the symbol of rule.[1] That a sacredness should be attached to such emblems was natural, and we can understand how Mr. Cormack, from Shanandithit's statements, should suppose them connected with their religion. We may add that in a vocabulary, to be noticed presently. taken down from her, of Beothic words, there are three objects of this kind named and representations given of them. One somewhat resembling the second in the upper part of Plate XI is called "the whale's tail," the second resembling a half moon, and similar to the third, is called kewis or the moon, while of the third, which somewhat resembles the lowest, but more exactly answers the description given by Lieut. Buchan of the one seen by him, the meaning of the name is not given.

It is, I think, worthy of consideration whether the practice of colouring themselves and their possessions red might not have had a religious or semi-religious character. From the prominence given to it by the Jewish prophets it seems to have had some such significance. Thus Ezekiel (chap. xxiii, 14, 15), referring to the idolatrous practices which the Jewish people borrowed from neighbouring nations, describes them as "doting upon the Assyrians, her neighbours," adding to her idolatries, "for when she saw *men pourtrayed on the walls images of Chaldeans pourtrayed with vermilion.*"[2] Jeremiah (chap. xxii, 14) notices the king's vanity specially as manifest in having his house "painted with vermilion." And the Book of Wisdom (chap. xiii, 14) represents them as colouring the idol itself in this manner, "laying on ochre (Greek miltos) and with paint colouring it red, and covering every spot in it." With this accord the recently exhumed Assyrian monuments. M. Botta noticed several figures on the walls of Khorsabad yet retaining a portion of the vermilion with which it had been painted. There is in the British Museum among the marbles sent from Nimroud by Mr. Layard a large slab with a figure of the king standing holding in his right hand a staff, and resting his left on the pommel of his sword, still having the soles of his sandals coloured red.

The same practice is found elsewhere. In Egypt the Sphinx was coloured red, so in Rome was the image of Jupiter, preserved in the Capitol. The Buddhist monks in Central Asia all wear a red cloak. We find it, too, among distant and barbarous tribes, who may have lost all idea of its original object. Thus Capt. Cook describes the inhabitants of Tasmania as having their hair and beards anointed with red ointment. And it is

[1] See also Psal. xxiii. 4, c x. 2, Jer. xlviii. 17, Ezek. xxxvii. 16, 17.

[2] Heb. *Shashar*, translated by Gesenius, red color, red ochre, by Keil, red ochre.

curious to note that they seemed to be a people separate from all the tribes in the neighbourhood, and of an older migration—a position, as we shall presently see, similar to that of the Beothiks.[1]

That they had the idea of the future state common among primitive people, both in the old and new world, as the counterpart of the present, is shown by their graves, in which survivors had buried with the deceased their implements and whatever else seemed necessary for their long journey to the happy hunting-grounds.

Looking at their habits and customs as bearing upon the question whether they form a race by themselves, independent of any other, or are racially connected with any of the surrounding nations or tribes, we may adopt the conclusion of Mr. Gatschet. "Their appearance, customs and manners, lodges and canoes seem to testify in favour of a race separate from the Algonkins and Eskimos around them, but are too powerless to *prove* anything. Thus we have to rely upon language alone to get a glimpse at their origin and earliest condition."

For this investigation the materials are not in a satisfactory state. Three vocabularies have been preserved. The first said, but I believe incorrectly, to have been taken down by Rev. Mr. Clinch, from John August, in 1774; the second by Mr. John Leigh, from Mary March, and the third by Mr. Cormack, from Shanandithit, in 1828. Part only of this last has been preserved, that containing the numerals, the month-names and those corresponding to English words under A and B. Together, however, they contain about three hundred words. But from various causes these vocabularies are in a very unsatisfactory state. Those who took them down were entirely ignorant of the language, and those from whom they received them were imperfectly acquainted with English. In Mary March's case it was sometimes necessary to represent by signs the object for which the Beothik word was wanted. Then the English alphabet is peculiar in its relation to sounds, and, in addition, indistinct handwriting has led to uncertainty or positive error.

Such as they are, they have been carefully studied by philologists, and compared with the language of various American tribes, particularly by R. G. Latham and Mr. Gatschet, an eminent American ethnologist, and also by Dr. Campbell of Montreal. As to the results Mr. Gatschet says: "A comparison with the Labrador and Greenland Innuit language, commonly called Eskimo, has yielded to me no term resting on real affinity. R. G. Latham has adduced some parallels of Beothik with Tinné dialects, especially with Taculli, spoken in the Rocky Mountains. But he does not admit such rare parallels as proofs of affinity, and in historic times at least the Beothiks dwelt too far from the countries held by Tinné Indians to render any connection probable. Not the least affinity is traceable between Beothik and Iroquois vocables, nor does the phonology of the two yield any substantial points of equality. All that is left for us to do is to compare the sundry Algonkin dialects with the remnants of Beothik."

So far philologists are agreed. But upon the question of their affinity with the Algonkin race, these inquirers have arrived at opposite conclusions. Mr. Latham, in his "Varieties of Man," says: "All doubts upon the subject have been set at rest by a hitherto unpublished Beothik vocabulary, with which I have been kindly furnished by

[1] On visiting a band of Cree Indians in the Northwest, I noticed a number of them having their faces and their lodges marked with red spots. On enquiry I found that these were heathen, and that as soon as they became Christians they abandoned the practice.

my friend, Dr. King of the Ethnological Society. This marked them a *separate section* of the Algonkin, and such I believe them to have been." Again, in the 'Proceedings of the Philological Society for 1850,' he has given a table of the affinities between the Beothik and other Algonkin dialects, in which he endeavours to show that, though the former differs very widely from the Micmac, it still belongs to that great family. Professor Campbell of Montreal, who has made the affiliation of the Algonkin languages the subject of careful study, comes to the same conclusion. In a letter to the writer he says: "The Beothik has its affinities with the old (mostly now) defunct Algonkin dialects of New England and with the Cree of to-day, branches of which are the so-called Scoffie or Sheshtapoosh and so called Montagnais. It is probably the most ancient Algonkin dialect, for by its numerals and vocabulary generally, it connects with the Philippine Islands."

On the other hand, Mr. Gatschet, after an elaborate investigation, comes to an opposite conclusion, regarding the Beothiks as racially and linguistically separate from the Algonkin. The grounds for this he sums up as follows:—

"The facts, he says, which most strongly militate against an assumed kinship of Beothik and Algonkin dialects are as follows: (1.) The phonetic system of both differs largely. Beothik lacks *f* and probably *v*, while *l* is scarce. In Micmac and the majority of Algonkin dialects the *r*, *dr* and *cl* are wanting, but occur in Beothik. (2.) The objective case exists in Beothik, but none of the Algonkin dialects has another oblique case except the locative. (3.) The numerals differ entirely in both, which would not be the case if there was the least affinity between the two. (4.) The terms for the parts of the human and animal body, for colours (except white), for animals and plants, for natural phenomena, for the celestial bodies, and other objects of nature, as well as the radicals of adjectives and verbs differ completely.

"When we add to all this the great discrepancy in ethnological particulars, as canoes, dress, implements, manners and customs, we come to the conclusion that the Red Indians of Newfoundland were a race distinct from the races on the mainland shores surrounding them on the north and west. This language I do not hesitate, after a long study of its precarious and unreliable elements to regard as belonging to *a separate linguistic family*, clearly distinct from Innuit, Tinne, Iroquois and Algonkin. Once a refugee from some part of the mainland of North America, the Beothik tribe may have lived for centuries isolated upon Newfoundland, sustaining itself by fishing and the chase. When we look around upon the surface of the globe for parallels of linguistic families relegated to insular homes, we find the Elu upon the island of Ceylon in the Indian ocean, and the extinct Tasmanian upon Tasmania Island, widely distant from Australia. The Harufuru or Alfuru languages of New Guinea are spoken upon islands only. Almost wholly confined to islands are the nationalities speaking Malayan, Aino, Celtic, Haida and Aleut dialects. Only a narrow strip of territory now shows from which portion of the mainland they may have crossed over the main to their present abodes."

When men so distinguished differ I have not the presumption to attempt to decide between them, and to discuss the various points I acknowledge myself unfit. But yet, looking at the whole discussion, there are certain points clear from the statements on both sides, and perhaps on the main question they are not so far apart as might at first sight appear. They all admit that the language differed widely from the Micmac and those of neighbouring Algonkin tribes. The dialects spoken by these are so nearly allied that the

members of one tribe can with a little trouble understand those of another. But between them and the Beothik the difference is so great that only a philologist can trace any resemblance, and that in a few words. To the Micmacs the Beothiks were so utterly unintelligible that one, asked about the speech of the latter, said: "No talkee, all same dog bow wow wow." Dr. Rand, a thorough Micmac scholar, and no mean philologist, could not trace any affinity between the two languages. Dr. Latham himself, after giving a table of affinities between the Beothik and other Algonkin dialects. ('Proceedings of the Philological Society, 1850,') appends the statement that Beothik was certainly not Micmac. All this goes to show that the Beothiks were not of the same migration with the Eastern Algonkins; that they must have been a much older race. This is admitted by all.

As to the affinity which Dr. Campbell finds between Beothik words and those of the older New England and Cree languages, if they indicate unity in their origin, they indicate long and wide separation. Dr. Latham, as we have seen, sets them down as "a separate section" of the Algonkin race. Even in regard to this he expresses himself somewhat doubtfully. He says merely ("Comp. Philology," p. 453) that the Beothik language "was akin to the languages of the ordinary American Indians, rather than to the Eskimo, farther investigation showing that, of the ordinary American languages, it was Algonkin rather than aught else."

It is to be observed that Mr. Gatschet had better opportunities for investigation than his predecessors, having access to additional vocabularies and having the old one corrected. He has examined the question as thoroughly as the materials at his command will permit. He finds in Beothik words undoubtedly Algonkin, but as they were on friendly relations with the Algonquins of Labrador, he thinks that they adopted the names of tools, implements and articles of exchange from the latter. Other Beothik words which resemble Algonkin ones of similar significations he regards as having no real affinity, and, as we have seen, adduces very strong reasons for his conclusion that they were separate races. The case that he presents is undoubtedly strong, and yet the list of cognate words in the Beothik and various Algonkin tongues sent me by Dr. Campbell seems to show a real though distant affinity between them. But whether they are a separate section of the Algonkin race, or a separate race in whose language traces of affinity are so faint as to indicate only an older relationship, we still have a peculiar people, one that, like Israel of old, dwelt apart among the nations. If any affinity at all can be traced, it is with the Northern Algonkins, who embrace the Crees and, some say, the Blackfeet in the west, and many tribes on to Labrador in the east. Going farther back, Dr. Campbell's view of their affinity with the Malayo-Polynesian race is at least probable, and putting this and all these circumstances together we may read, at least partially, their early history.[1] Passing from island to island, they cross the Pacific in canoes, of which perhaps those last used in Newfoundland were a memory till they struck the continent. For some reason, probably from the power of races more to the south, they were directed to the north. Here they formed the first wave of an emigration across the continent, between

[1] Since this was written I have received another communication from Dr. Campbell, written after he had had an opportunity of examining a fuller vocabulary of the language, in which he reiterates his view of the Beothiks being a branch of the Algonkin race, and supports it by comparative lists of words in Beothik and other languages spoken by that race. He also sends a similar list of words in various Malayo-Polynesian tongues.

the Eskimo on the extreme north and the powerful races to the south, and probably in hostility with both. Impelled eastwardly, they at length reach the shores of the Atlantic Here they meet tribes of the Algonkin race advancing, as all their traditions tell us, from the south-west. Of these the Micmacs were the most northerly, and there is reason to believe that here the two came into violent collision. When first met, in historic times, that people were found carrying on war to New England on the south-west and to the St. Lawrence on the north. Charlevoix tells us that they even pursued the Eskimo to their haunts across it. The traditions of the Montagnais (see "Hind's Exploration in Labrador") tell abundantly of their contests with the Micmacs. Now, so far as known, the former were on friendly terms, perhaps kindred and allied with the Beothiks. Moreover, according to the tradition of the Micmacs, they had driven out a previous race from Nova Scotia. Of such conflicts we have probably the evidence in mounds, which have been found to contain bones heaped together and bearing marks of violence. John Gyles, in his account of his captivity among the Indians on the St. John River, 1689-1698, I believe Micmacs, certainly a tribe closely associated with them, after describing their fear of the Mohawks, says: "They are called Maquas, a most ambitious, haughty and bloodthirsty people, from whom the other Indians take their measures and manners and their modes and changes of dress." I have already mentioned that the Micmacs called the Red Indians Maquajic, which an Englishman would naturally translate the Maquas. We cannot doubt that the reference is to the Beothiks, and the terms in which they are described simply expresses the hostile feelings entertained toward them and the fear entertained of their powers.

We regard, then, the Micmacs as the old enemies of the Beothiks, who were by them driven from the continent to their final place of rest in Newfoundland. Sir Wm. Dawson ("Fossil Men," p. 163) indeed tells us that they followed them thither. When, therefore, the French established themselves on Newfoundland, and some Micmac families moved over to reside there permanently, the collision with the Beothiks that ensued we regard as not originating with the French. The natural conclusion is that the latter were drawn into it by their close alliance with the Micmacs, and that they here repeated the mistake made by Champlain, when, in association with the Algonkins, he made war upon the vengeful Iroquois.

Thus, to the poor Beothiks even this island beyond the sea, stretching so far toward the old world, was to afford no resting place for the sole of their feet. On the contrary, they were here to meet foes more powerful and not more peaceful, furnished with more deadly weapons, so that with Shanandithit, in 1829, the last of them passed away, leaving neither name nor memorial on the earth. Such a total destruction of a people is almost unparalleled. Other peoples have been cut off, but portions of them mixing with others have perpetuated, if not their name, at least their blood, but to them might be applied the language of Logan regarding himself: "There runs not the blood of a Beothik in the veins of a single living creature." Nations have disappeared, but their material works or their institutions remain as memorials of their genius or their power. But only a few rude stone implements testify to the skill of this people. Other races have had to see themselves dispossessed of their territory, but the names remain, testifying on the face of the country to the language of its former occupants, but not a storm swept headland on

the coast of Newfoundland, not a stream or mountain in the interior, recalls the speech of those who once possessed the whole. The gentle race has passed away for ever,—

> Gone like the cloud-rack of the tempest,
> Like the withered leaves of autumn;

gone without hearing of the Christian's God or knowing the Christian's hope; while humanity weeps over a history without a solitary incident on which its eye can rest with pleasure, and righteousness wonders if in the ear of infinite justice the blood of these unfortunates does not yet cry from the ground.

NOTE.—The articles of Mr. Gatschet referred to will be found in the Proceedings of the American Philosophical Society, v. 22 for 1885, pp. 408-424, and v. 23 for 1886.

ERRATA.

In Dr. Bourinot's Paper on Cape Breton :

Page 173, 1st line of "Prefatory Note," for "last century" read "*present* century."

Page 174, No. IV ("Illustrations in Text") for "Admiral Hovenden's Cross," read "Admiral Hovenden *Walker's* Cross.

Page 202, for "Rasle" read "*Rale.*"

Page 231, 4th line from top, for "people of England" read "people of *New* England.'

Page 234, 4th line from foot, for "Abercrombie" read "*Abercromby.*"

Page 290, last line, leave out "French" and insert "*old.*"

VII.—*Cape Breton and its Memorials of the French Régime.*

By J. G. BOURINOT, C.M.G., LL.D., D.C.L.

(Read May 27, 1891.)

PREFATORY NOTE.

Since the beginning of the last century Cape Breton, once known as Ile Royale, has been to the world at large very little more than a mere geographical expression, and the importance which it possessed in the times when England and France were struggling for the supremacy in North America has been long since forgotten except by the students of history. In the present work it is the object of the writer, a native of Cape Breton, to record briefly the main facts in its history from the days of its discovery by European voyagers in the remote past down to the present time, when a stream of travel is already beginning to find its way to an island abounding with so many features of natural and historic interest. In the narrative of the days of the French *régime*, especially from 1740 to 1758, stress has been naturally laid on the important position Ile Royale once held with relation to New France and the old Thirteen Colonies. Maps and illustrations have been added to give completeness and clearness to the narrative. Many pages of critical and bibliographical notes are appended, with a view of relieving the main text of much historical matter chiefly interesting to the students of the past. In these notes there are references to all the literature which I have been able to find relating to the history, resources and industries of this valuable and interesting section of the Dominion of Canada.

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I. The History of Cape Breton from its discovery until the Treaty of Utrecht in 1713.

"We have no title-deeds to house or lands
Owners and occupants of earlier dates
From graves forgotten stretch their dusty hands
And hold in mortmain still their old estates."

The words here quoted from the poet Longfellow have more than a poetic meaning to one who studies the nomenclature of the island of Cape Breton in the light of the historic past. Not only the name of the island itself, but its bold headlands, its spacious bays, its broad estuaries and harbours, connect us in the present with those adventurous fishermen and mariners who explored its coasts and waters centuries ago. Basques, Bretons, Normans, Portuguese and Spaniards have made an impress on its geography which its continuous English occupation for a hundred and thirty years has failed to remove. Traditions of Norse voyagers hover around its shores, and we are carried into a realm of mist and shadow when we endeavour to solve the secrets of its past. It is quite probable that Biarne Heriulfsson, a son of one of the Icelandic settlers of Greenland, found himself off the coast of Cape Breton during his voyage of 986, when, attempting to join his father in his new home, he lost his course and was tossed by adverse winds into unknown waters where he saw a land, which appeared from the sea flat and covered with trees, and may have been some part of the southern coast of Cape Breton which presents features very different from those of the northeastern and northwestern coasts, so remarkable for their lofty headlands and mountains. Fourteen years later Leif Ericsson, a son of Eric the Red, an Icelandic jarl, who was the first coloniser of Greenland, made a voyage to find the lands of which Biarne had brought home vague reports. Learned writers have devoted themselves with much enthusiasm to the study of the sagas which are now generally admitted to show internal evidence that the brave adventurers of the north of Europe have a strong claim to the honour of having first visited the continent of America. But while these writers have given us ground for believing in the antiquity and authenticity of the sagas, they have not yet succeeded in satisfactorily solving the mysteries of these old manuscripts of the north and identifying beyond dispute the countries and places to which the Northmen gave a name. Labrador answers in a measure to the description of the dreary land which all the way from the sea as far as snowy mountains in the distance appeared one field of snow, and which the voyagers called Helluland on account of the "flat stones which they saw in that country of no advantages." The vague description given of Markland, or forest-clad land, to which Leif came next,—a relatively level country, covered with trees, and having white sandy beaches—applies to

many parts of the southern coast of Cape Breton and Nova Scotia, from the low island of Scatari, to Halifax harbour and even as far west as Cape Sable, when sighted by sailors in a passing ship. One learned searcher[1] into American antiquities, while exercising his ingenuity to trace the route of the Norse voyagers, ventures to go so far as to express the opinion—a dreadful heresy no doubt to some American scholars—that Cape Breton was the northern part of that Vinland to which Leif came at last, and where he and his companions made a temporary settlement. So far it must be admitted that the most thorough investigation made into this subject hardly bears out such a conclusion, but rather points to Cape Breton having been comprised in the indefinite description given of Markland,[2] and to some part of New England having been the land of vines and of sweet honey-dew, of which the travellers told such pleasant tales on their return to Greenland. A curious mound, or some rock with mysterious marks, a deep bay resembling the gloomy fiords of the Scandinavian lands, low sandy shores, or snow-capped hills, are all so many texts on which to build theories, and write elaborate treatises to connect the present with the story of the sagas; and one often rises thoroughly perplexed from the perusal of these laboured disquisitions of some of the students of times so enshrouded in mist. Be that as it may, the northern adventurers have left no memorials of their voyages on the shores of Cape Breton, and the historian in these days must be content with the conjecture that they were the first of European voyagers to see the eastern portions of the wide expanse of territory now known as the Dominion of Canada.

Neither does history record the exact time when the adventurous Basque and Breton fishermen first fished in the Gulf of Saint Lawrence and anchored their clumsy vessels in the bays and harbours of the island which there is some reason to believe they visited even before the voyages of the Cabots to the continent of America. It is not often that we find evidence more conclusive in support of early exploration than that which connects the name of Baccalaos, the Basque for cod, with the countries in the gulf where that fish is found in such abundance. It requires little or no imagination to suppose that these brave Basque fishermen and sailors who, from time immemorial, have made their home on the deep, should, at last, have found their way to the waters of eastern America. We see the name of Baccalaos in the oldest maps of the sixteenth century, and it is claimed that the Cabots heard the name among the Indians of the lands which they visited at the close of the fifteenth century.[3]

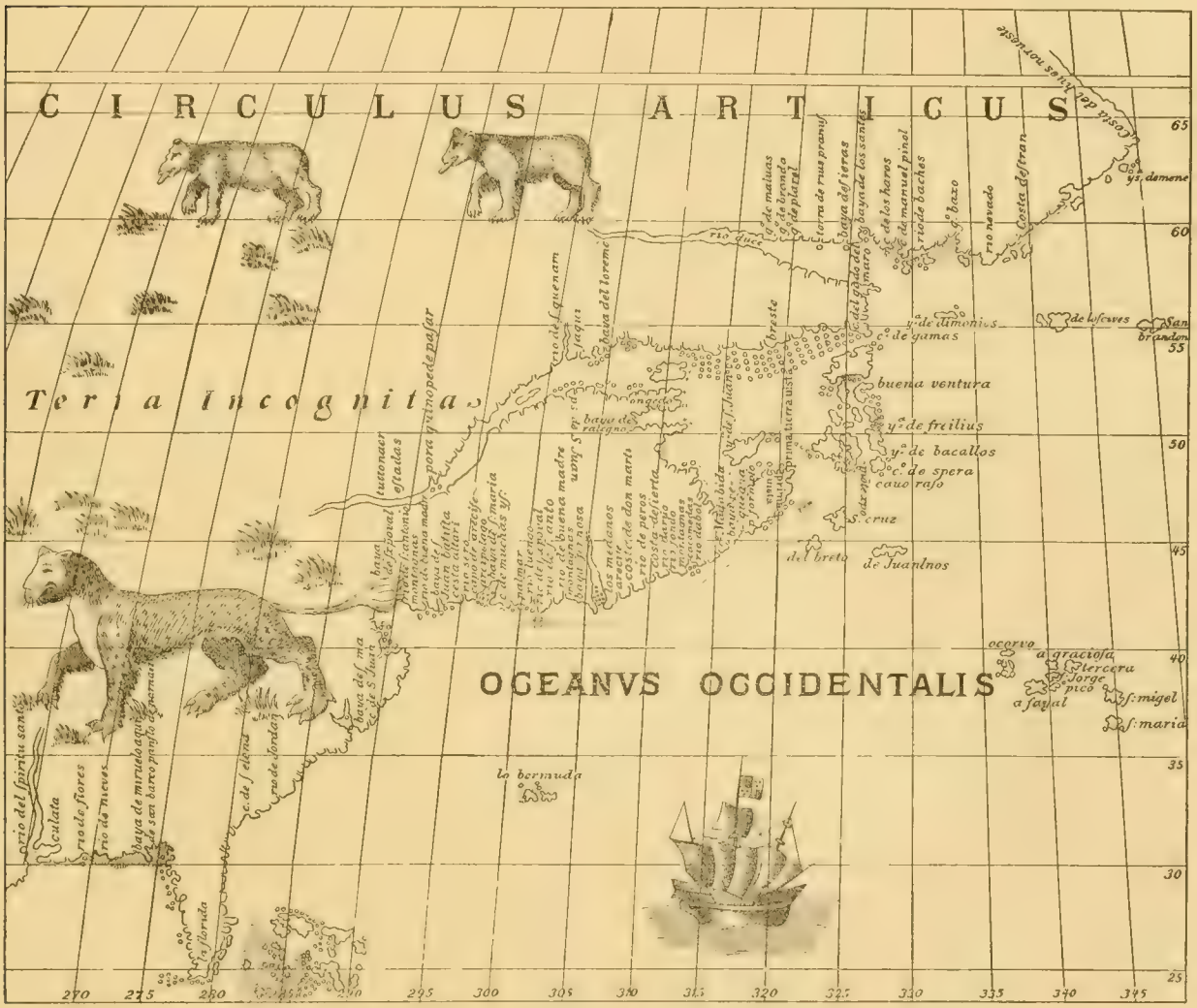
In all probability the Cabots, John and Sebastian, were among the first Europeans after Biarne and Leif Ericsson to coast along its shores. In a map of 1544, only discovered in Germany in 1843, and attributed to Sebastian Cabot, but not accepted by all historians as authentic, the northeastern point of the mainland of North America, presumably Cape North, is put down as "prima tierra vista;" and there are not a few historical students who believe that this was actually the landfall seen by John Cabot in his first memorable voyage to this continent. In the controversy which has gone on for years as to the first land seen by Cabot and his son—whether the coast of Labrador,

[1] Professor Gustav Storm, in the 'Mémoires de la Société Royale des Antiquaires du Nord' for 1888. See App. I to this work, where references are given to various writers on the Northmen and their voyages.

[2] "The more general opinion," says Fiske, "Discovery of America," i. 164, favours Cape Breton or Nova Scotia.

[3] See App. V to this work for the origin of the name Baccalaos, and its extended and uncertain use in old maps of Eastern America.

or the northeastern cape of Cape Breton, or Cape Bonavista or some other headland on the eastern shores of Newfoundland—many pages of speculation and argument have been, and will probably continue to be advanced in support of these various theories; and the reader who wishes to come to some definite conclusion on this vexed subject only rises from the study of these learned disquisitions with the feeling that a great mass of knowledge has been devoted to very little purpose except that purpose be to leave the question still open, and give employment to learned antiquarians for all time to come. One may, however, easily arrive at the conclusion, after a perusal of these contradictory views of



East coast of North America, from the Sebastian Cabot mappe monde, 1544.

the Cabot voyages to Eastern America, that the claim of Cape North or of some other part of the eastern coast of Cape Breton to have been the landfall of Cabot—the prima tierra vista—is as strong as the claim of any part of Labrador or Newfoundland, to the same distinction. Indeed unless we are prepared to reject the map of 1544 as a fabrication—and certainly the evidence on the whole is to the contrary—we should give the island of Cape Breton the benefit of the doubt and believe that it was the first land that

John Cabot and his son saw in America early in the morning towards the last of June —without doubt in 1497—when they had made their way from Bristol to the unknown countries of the West. The northern part of Cape Breton in many respects corresponds with the general features of the description given of the new land, of its inhabitants, of its animals, and of its fisheries, in the legend or inscription[1] on the map in question—a legend which has also given rise to much speculation as to its authorship and authenticity, but which nevertheless must be taken into the account unless we ignore the document in its entirety. The people clothed in the skins of animals—that the voyagers saw on the shore—were probably the Micmacs who were a coast tribe, and must have frequented the northern parts of Cape Breton in considerable numbers in early times on account of the abundance of game. The great deer—cieuros muy grâdes como cauallos—were no doubt the moose which in great numbers roamed among the hilly fastnesses and fed on the barrens—the tierra muy steril—of northern Cape Breton until they have been in the course of time almost exterminated by reckless hunters. The advocates of the claim of Labrador argue that the mention of the appearance of white bears in this new found land of Cabot is in favour of their contention, but it is not at all unlikely that these animals frequented the northern coast of Cape Breton in those early times when the island contained great numbers of wild creatures, many of which have entirely disappeared with the progress of settlement. It is a powerful fact in support of the Cape Breton theory that, in a work written by one Pichon on the island of Cape Breton two centuries and a half later than the Cabot voyages he tells us in his chapter on the natural features of the country that the bears of Cape Breton and of St. John are "much the same as those in Europe, and some of them are white"—a statement which is almost conclusive on the point at issue.[2] It is quite probable too, that the ice-floes that have always come down

[1] In App. II to this work will be found the Spanish inscription on the supposed Sebastian Cabot mappe monde, but for the information of the reader the literal translation is given here: "No. 8. This land was discovered by John Cabot, a Venetian, and Sebastian Cabot, his son, in the year of the birth of Our Lord Jesus Christ, M.CCCC.XCIIII., on the 24th of June in the morning, which country they called 'primâ tierra vista;' and a large island over against the said land they named the island of St. John because they discovered it on the same day. The inhabitants wear skins of animals, use in their battles bows, arrows, lances, darts, wooden clubs and slings. The soil is very barren, and there are many white bears and stags as large as horses, and many other beasts; likewise great quantities of fish, pike, salmon, soles as long as a yard, and many other sorts, besides a great abundance of the kind called baccalaos. There are also in the same land hawks as black as ravens, eagles, partridges, redpoles, and many other birds of various descriptions." M.CCCC.XCIIII. is an error, corrected by joining the first two letters after XC at the bottom, thus making a V, and M.CCCC.XCVII. Fiske, "Dis. of Am.," ii. 5, 10.

[2] White bears in early times were probably found in considerable numbers in the northeastern parts of Canada. Sagard, "Histoire du Canada et Voyages" (i. 147, ii. 682, ed. of 1866, Paris), tells us that in the time (1633-4) he wrote his work that "they inhabited not only the island of Anticosti, but also the country at the mouth of the St. Lawrence, which was frequented by very few Indians, but the places where they are generally found is among the high mountains and very cold countries." See also Champlain's works, Abbé Laverdière's ed., iv. 1088. The Montagnais Indians call the island "Natascouch," which means the place where they take bears. *Ib.*, i. 67, note by Abbé Laverdière. The mountainous, wild district of northern Cape Breton would most likely centuries ago be the most southerly limit of these animals. The fact that it is only on the northern parts of Labrador they are now seen, and hardly at all on the Atlantic sea-board of that dreary region, shows how their habitat has receded north in the course of several centuries since Cabot entered the Gulf.

Many animals that formerly existed in the Gulf have disappeared within a century or two. Dr. Patterson in a paper on the Magdalen Islands ('Trans. of the Nova Scotia Inst. of Science,' Jan. 1891), shows that the walrus which was once found in such numbers on their shores—a place is still called Vache de Marino—is now practically extinct. The same animal was found on the southern shores of Cape Breton and on Sable Island.

the gulf even as late as June from the great icefields of the north, brought with them bears to the northern shores of Cape Breton in days when they were quite common enough from the entrance of the St. Lawrence to the Straits of Belle Isle and beyond. Much speculation has been indulged in whether Prince Edward Island was the island adjacent to the new found land and named St. John by Cabot in honour of the Saint on whose festival he discovered it. An argument, however, might be advanced in favour of the well-known cape, from which the island of Cape Breton derives its present name, having been actually the first landfall of Cabot in American waters. All the European sailors of old times naturally made for this easily reached landfall when they came to the Gulf,[1] and eventually it became like Cape Race, one of the most important land-marks in the waters of eastern America. Quite close to this noted cape, in fact adjacent to it and in this respect answering to the description in the legend,—una isla grâde que esta par la dha tierra—is the barren, triangular island of Scatari, which in form much more resembles the island given in the supposed mappe monde of Sebastian Cabot than does the present Prince Edward Island. But against this theory, which certainly has some arguments in its support, must be placed the fact that the position of Scatari, or in other words its relation to Cape Breton, does not correspond to that given to St. John's Island on the map. As long as we accept the map as authentic, and its legends as entitled to credence, we must give the priority to Cape North and Prince Edward Island.[2] Without dwelling further on the point and perhaps adding to the perplexities of a sufficiently intricate subject, we may come to one conclusion in which all will agree, that the voyages of the Cabots commenced a new era in the history of North America. In the beginning of the sixteenth century the Portuguese discovered Labrador to which they gave a name, and probably explored a considerable portion of the coasts of Newfoundland, Cape Breton, and Nova Scotia, and there are even those who in their enthusiasm advance the theory that these European voyagers were the first to enter the Saint Lawrence;[3] but whilst there is no doubt that they sailed through the straits of Belle Isle and visited parts of the gulf of Saint Lawrence, including Cape Breton, many years before Jacques Cartier found his way to the same waters, no mere speculation can diminish the fame of the latter as the discoverer of the noble country which must be always associated with the name of the bold sailor of Saint Malo. As the Cabots laid the foundation of the claim of England to a large portion of the North American continent from Cape Breton to Florida, so Cartier gave to France the valley of the Saint Lawrence, and prepared the way for the courageous

[1] Sir Humphrey Gilbert, for instance; see *infra*, sec. XI.

[2] See App. II to this work, where references are given to the principal authors who have made the Cabot voyages their special study, and have with more or less success worked out their respective theories.

Dr. Kohl, in his work on the Discovery of Maine ('Hist. Soc. Coll., Portland,' 1869), expresses the opinion that the "prima vista" of the Cabots "would not probably have been the northern point of Cape Breton but the small island of St. Paul near it which is generally the first land made by sailors entering the Gulf of St. Lawrence." On the contrary, if "prima vista" was not the cape from which the island is named and generally the first point made in old times, it was most likely Cape North, and not St. Paul, which is ten miles distant in a direction quite opposite from the course clearly taken by John Cabot. After he sighted the northern head of the island, he made next for St. John island according to the inscription on the mappe monde. If he entered the southern entrance of the Gulf, he must have made either Scatari or Cape Breton or Cape North—certainly the evidence so far as it goes sustains the theory that his course took him to the latter point.

[3] For an able statement of the Portuguese claim, see Rev. Dr. Patterson's paper in the 'Trans Roy. Soc. of Can., (1890), vol. viii, sec. 2. Also, 'Magazine of American History' for May, 1891. See App. III to this work.

Frenchman of Brouage who, a few decades later, made on the heights of Quebec the commencement of that dependency which France, in her ambition, hoped would develop until it could dominate the whole continent of North America.

Though it is not likely now that the true course of the Cabots in their first voyage to eastern America and the actual locality of "Prima Vista" will ever be cleared up to the satisfaction of all students of history, there is no doubt whatever that Jacques Cartier, on his return from his second voyage in 1535-6 to Canada, discovered the passage to the Atlantic between Cape Breton and Newfoundland, and sighted the bold headlands and picturesque cliffs of the northern part of the former island. It is probable that he gave the name of Lorraine to the cape which in the course of two centuries has become Cape North, aptly called "the watch-tower of the gulf."[1] We are told in the accounts of his voyage that he saw another cape "towards the south," and gave it the name of St. Paul's, and although there is much difference of opinion as to its exact situation, the weight of authority goes to show that reference is made to a point on the eastern coast of the island to the south of Cape North, assuming the latter to be Cape Lorraine. It is not unlikely that Cartier saw in the distance the bold headland which in later times was Smoky Cape (Cap Enfumé), on account of the cloud of mist which so often envelopes this storm-swept landmark of the gulf.[2] It does not appear, however, that Cartier ever landed on the coast of Cape Breton, and the statement that is found in some books that he built a fort and lived one winter on the island has no foundation in fact. The same assertion has been made of his friend and patron, the Lord of Roberval, who was chosen by the King of France to settle the new country discovered by the sailor of St. Malo. It is now well established that Cape Breton was mistaken by some writers for Cap Rouge, near Quebec, where both Cartier and Roberval—the former in 1541, and the latter in 1542—erected forts for the defence of the infant settlement.[3]

We have abundant evidence to show that, during the greater part of the sixteenth century, French, Spanish and Portuguese fishermen probably frequented the coast of Cape Breton, but it was not until the close of that century that English vessels were found in any number engaged in the fisheries of the gulf. It is now claimed that Baron de Léry's abortive effort of 1518 to establish a settlement was made at Cape Breton, and not at Sable Island, as generally supposed, but this is an entire mistake.[4] The Portuguese made an attempt in 1521 to settle a colony on the coast of Cape Breton, and the best authority at hand seems to point to the little bay of Inganiche, on the picturesque northeastern shore, as the site of the infant settlement, which Champlain tells us was very soon deserted on account of the rigorous and inclement climate.[5] But while Spaniard and Portuguese ventured into the bays and rivers of the island, and in all probability attempted to establish temporary posts for trading and fishing purposes, they have not given to Cape Breton the name it bears. The origin of this name is even a matter of controversy between those who claim the Basques or the Bretons to have been the discoverers of the island. Some claim that

[1] Judge Haliburton, in his "History of Nova Scotia," ii. 231.

[2] See App. VII to this work, where reasons are given at some length for the opinions set forth in the text.

[3] See App. VII (last paragraph) to this work.

[4] Fiske ("Disc. of Am.," ii. 492, *n*) cites Le Tac, "Histoire chronologique de la Nouvelle France," but the references (pp. 40, 57) are unmistakably to Sable Island.

[5] See App. VIII (4) to this work.

it was the Basque fishermen who first made the cape[1] on the eastern coast, and named it after a Cape Breton in that very Basque country which, in the earliest times of which there is any record, sent many adventurous sailors to Newfoundland and the Gulf of St. Lawrence. On the other hand, it is urged that the name is only a memorial of the voyages of the Breton and Norman sailors and fishermen of Honfleur, Dieppe and St. Malo, who sailed in company to eastern America even before the days of Columbus.[2] In support of the Breton claim we find on the oldest maps of the sixteenth century that the cape is described as Cap de Bretton, Cap aux Bretons, Cavo de Bretonni, and the mainland, afterwards Acadie, as the Terre aux Bretons, or Terra de los Bretones, or Terra de Breto. In a Portuguese portolano map, the date of which is believed to be either 1514 or 1520, there is a country described in Portuguese as "the land discovered by the Bretons." On the authority of a "great French captain," supposed to be Jean Parmentier of Dieppe, whose narrative is credited to 1539, the Breton and Norman voyagers are described as having visited the waters of the Gulf of St. Lawrence as early as 1504, and given the well-known headland of the island its present name. The entrance of the gulf, between Cape Breton and Newfoundland, is described in Allefonsce's map of 1544-5 as "L'Entrée des Bretons." In view of the vagueness of the Basque theory, which is chiefly supported by the fact of the existence of a Cape Breton on the southeastern coast of France, we can hardly fail to come to the conclusion that the Bretons gave to the cape the name it has always borne. Indeed we may well believe that the two capes in France and America owe their same name to these very adventurous mariners, who have from immemorial times hovered off the coasts or anchored in the harbours of the Bay of Biscay and of the Gulf of St. Lawrence as well.

But while there is every reason to believe that the cape was named early in the sixteenth century, we have no authentic record of the exact date when the island itself was called after its most eastern headland. Leaving the realms of mere speculation, which only bewilders and never satisfies a practical historian, we must content ourselves with the fact that the name of Cape Breton has always clung to the island so long frequented by Basque and Breton fishermen. During the first forty years and later in the sixteenth century the name is found on old maps which have come down to us.[3] It is given either to to the most eastern point of the mainland, a region described as *Terre des Bretons* or *Terra de Breto*, according to the nationality of the map-maker, or to a little island adjoining. It is interesting to note to how many makers of the old maps of the Gulf of St. Lawrence the existence of an island occupying the present position of Cape Breton appears to have been

[1] "Cape Breton, better known to the mariners of the coast by the name of Port Novy Land, from the small adjacent islet of Puerto Nuevo, is the most eastern and also the lowest part of the coast. It is singular that this point, exposed to the continual fretting, dashing and ebullition of this peculiarly restless sea, and placed at the mercy of every storm that sweeps the Atlantic, should yet bear so little evidence of its power. The firm materials of its composition seem scarcely to have been worn by the effects of centuries; and though so low, bold water forming its margin, instead of reefs of scattered rocks and other marks of ruin, is a proof of its unbroken strength." Haliburton, "History of Nova Scotia" (Halifax, N. S., 1829), ii. 213-214. Some call the island in question Porto Novo, which would indicate a Portuguese origin.

[2] See App. VI (last paragraph) to this work.

[3] See App. VI to this work, where a summary is given of the old maps on which Cape Breton as a cape or island is marked. Extracts are also given in App. VII and VIII from the accounts of the voyages of Cartier, Champlain, Bellinger (1583), Sylvester Wyett (1594), Charles Leigh (1597), Nicolas Denys (1672), in which mention is made of the island and the cape from which it was eventually named.

known. In a map of 1544-45 by Allefonsce, who accompanied Roberval to Canada as his pilot in 1541, and was the author of a well-known work on cosmography, the island of Cape Breton is roughly defined, and the entrance to the gulf, as I have previously stated, is distinguished as the *Entrée des Bretons*. In the later map of Mercator, which shows a distinct advance in cartography and in the knowledge of these waters, evidence is given of the existence of a large island on the eastern coast, although the name itself is still only affixed to one of its capes. Year by year, however, as the maps of the sixteenth century clearly show, especially after Cartier's famous voyages, a knowledge of the coast lines of the eastern parts of North America was steadily growing, and from the coming of Champlain to this continent we must date the commencement of a new era in the colonization and the geography of America. His map of 1612, with all its defects, gives the most accurate description of the general features of Cape Breton which had appeared to that time. Although no name is given to the whole island, its leading natural characteristics, especially the great arm of the sea which nearly divides it into two parts, the large island on its southwestern coast, afterwards known as Isle Madame, English Harbour, now Louisbourg, Inganiche and its northern cape, Saint Loran, now probably Cape North, are delineated with some degree of correctness. The Strait of Canseau is defined, but it is distinguished in a note as the *Passage du Glas*, whilst Cançeau, from which it subsequently took its name, is accurately placed on the southeastern shore of Acadie or Nova Scotia. In Champlain's later map of 1632 the general features of the island are better still defined than in the former case, and the Strait of Canseau is given the name which it has generally borne, while the rocky islet of St. Paul, which was incorrectly placed in 1612, begins to find its proper geographical position. But even on this later map the island is not given the general name of Cape Breton, though the present Prince Edward Island is called St. Jean. In fact, it is not clear when the name of Cape Breton was given by geographers to the whole island. As previously stated, the name of the land of the Bretons was for many years, in the oldest maps, given to a large ill-defined country which was afterwards known as Acadie. In L'Escarbot's map of 1609, which is by no means so accurate as Champlain's of three years' later, the island is described as Bacaillos, the Basque term which was indifferently applied during the previous hundred years to Newfoundland and Labrador and the countries generally on the gulf where the cod is most plentiful, and which in these later times has disappeared from those lands and now clings only to an islet off Conception Bay, latitude 48° 6″, and to a cape on the western coast of Nova Scotia.[1] Champlain, writing in 1603, calls Cape Breton the island of Saint Laurent, "where," he adds, "is *le cap Breton* and where a nation of savages called the Sourequois [Micmacs] pass the winter." In his account of his later voyages, however, he writes of the island of Cape Breton (*île du cap Breton*). It would seem that the name was not well established for some time, but that it gradually became the custom to apply the name of the cape to the island itself. We see that is the case in the accounts given of two voyages made by two English vessels in 1594 and 1597, in which there is a distinct reference made to the "Island of Cape Breton." A French writer[2] of later times tells us that the island was "first of all called the Isle du Cap,[3] and afterwards the English Harbour,"

[1] See App. V to this work.

[2] Pichon *alias* Tyrell, author of a memoir of Cape Breton. See App. IX to this work, where the curious history of this erratic person is briefly told.

[3] In Herman Moll's Atlas (London, 1715-20) Cape Breton is called Gaspey Island. See map 4 showing north parts of America claimed by France.

the last being the old name of Louisbourg, which, in Champlain's time and many years later, was the favourite resort of English fishermen. It was in the reign of Elizabeth that Englishmen began to show that spirit of maritime enterprise which was afterwards to have such remarkable results in later times by the establishment of the greatest colonial empire which the world has ever seen. In the course of the sixteenth century, when the rich fisheries of Newfoundland and the islands of the Gulf of St. Lawrence became known throughout Europe, English fishermen ventured into the waters which had long been the resort of the vessels of France, Portugal and Spain, and by the beginning of the seventeenth century there were probably over two hundred English craft of various sizes engaged in this great industry. Louisbourg, easy of access from the ocean, invited the English, at an early date, to make it their port of call. The Spaniards preferred the present harbour of Sydney, which is even yet known as Spanish River, and the French for many years sought shelter within the safe haven of St. Anne's, embosomed in the hills of the northeastern coast of the island.

The discoveries of Verrazano in 1524 and of Jacques Cartier in 1535 gave France a claim to Acadie, Cape Breton and Canada. England's title came from the voyages of the Cabots. Sir Humphrey Gilbert, a relative of the bold and chivalrous Raleigh, was the first Englishman of note who ventured, towards the close of the sixteenth century, to the shores of Newfoundland and took possession of the island in the name of Elizabeth, but his expedition had no other results than a barren assertion of a claim of sovereignty [1] and his tragic death at sea on his return to Europe. The Marquis de la Roche, a little later in the same century, made an abortive attempt to establish a settlement in the new domain which France now began to claim in America, but his hopes perished in the relentless sands of Sable Island. It was not until the beginning of the seventeenth century that either France or England was able to make a permanent establishment in the new world. Raleigh, above all other Englishmen of his time, saw that fame and fortune were to be won in America, but his first attempt to found a little colony in Carolina entirely failed, and the historian for centuries since has speculated on the fate of the unhappy people who landed in 1587 on Roanoke Island.[2] The attempts of Sieur Chauvin and Sieur Aymer de Chastes to colonize New France were equally unfortunate, and the seventeenth century opened without a single European settlement on the whole coast of North America except the Spanish post of St. Augustine at the extreme point of the peninsula of Florida. At one time, indeed, it seemed as if the lilies of France would have floated over that southern region and Protestants would have found in those times of oppression

[1] Sir Humphrey Gilbert, on the 5th of August, 1583, in the harbour of St. John's, Newfoundland, "summoned the merchants and masters, both English and strangers [of the ships in port] to be present at his taking possession of those countries. Before whom openly was read and interpreted unto the strangers his commission, by virtue whereof he tooke possession in the same harbour of St. John, and 200 leagues every way, invested the Queene's Majestie with the title and dignite thereof, had delivered unto him (after the custome of England) a rod and a turffe of the same soile, entring possession also for him, his heires and assignes for ever." See report of Mr. Edward Haies, gentleman, and principall actor in the same voyage," Hakluyt's Collection (Edmund Goldsmid's ed., Edinburgh, 1889), vol. xii, p. 337. Sir Humphrey does not appear to have entered any port or landed in Cape Breton, if indeed he ever made the stcoa. See *infra*, sec. XI, for a claim that one of his vessels was wrecked in Louisbourg harbour.

[2] See an interesting paper, "The Lost Colony of Roanoke: its Fate and Survival," by Professor S. B. Weeks, in the Papers of the American Historical Association, 1891; also, in Mag. of Am. Hist. for Feb., 1891.

a refuge from the treachery and bigotry of kings and priests in Europe, but the Huguenot settlements of Ribaut and Laudonnière were soon destroyed by the greed and fanaticism of the false Spaniard, and, when a new century dawned, the Spanish flag was the only sign of European dominion from the Gulf of Mexico to the frozen regions of the north.

During the first decade of the seventeenth century there happened three remarkable events in the history of the continent of America. In the western part of Nova Scotia, then Acadie or Cadie, on the banks of a beautiful basin where the tumultuous tides of the Bay of Fundy ebb and flow, we see a sleepy old town which recalls another world and another century. In the June days the air is redolent with the perfume of the apple-blossom and the hawthorn, the bells of ox-teams tinkle in the quiet streets, and the whole town bears the aspect of a dignified old age, which, having had its share of the world's excitement, now only asks to be left alone to spend the remainder of its years in placid ease. There it was, in the beginning of the seventeenth century, Sieur de Monts and his French compatriots laid the foundation of the old settlement of Port Royal, which was long the capital of Acadie and the beginning of the French *régime* in the great region of New France. Two years later, in 1607, a little colony of English ventured into Virginia, and although in these days the only vestiges of that settlement are a few tombstones and grassy mounds, which are themselves rapidly disappearing beneath the encroachment of the tides, the site of Jamestown must ever be interesting to the historian and the statesman as the commencement of that remarkable experiment of colonization which has established a federal union of over sixty-four millions of people, distinguished for their energy, their enterprise, and their capacity for self-government. Only a year later, in 1608, Champlain, sailor, explorer and statesman, founded the colony of Canada on those picturesque heights on which, in the course of nearly three centuries, a city has grown, so remarkable for its natural beauty, its capacity for defence, and its memorials of the history of France in America.

The first decade of the seventeenth century will ever be memorable for the foundation of that "Old Dominion" which must receive honourable mention as the pioneer colony in the plantations of English America, and for the genesis of that new Dominion which, two centuries and a half after the settlement of Quebec, was to stretch between two oceans, and comprise an area of territory almost as great as that of the nation which was born at Jamestown in 1607.

Port Royal, known in later times as Annapolis, in honour of a not very brilliant English queen, is therefore the first permanent settlement made by Europeans between Florida and the Arctic regions. Nova Scotia and Cape Breton have the oldest history of any part of the Dominion of Canada;[1] for there is little doubt that their shores were visited by the Norsemen, the Basques and Bretons, the Cabots and the Portuguese in the course of those adventurous voyages whose dim traditions and uncertain records have long perplexed, and must continue to perplex, the students of the ancient annals and cartography of this continent. Indeed there much reason for the theory, to which I have previously referred, that John Cabot first made one of the capes of the island; but without dwelling again on this vexed question, it is sufficient to know that Cape Breton and Acadie or

[1] "As early as 1504 the fishermen of these latter people [Bretons and Normans] seem to have been on the northern coasts, and we owe to them the name of Cape Breton, which is thought to be the oldest French name in our American geography." Justin Winsor, "Christopher Columbus," p. 555.

Cadie, included in the mysterious regions of Norumbega or Norembeque, or Arambec,[1] or Terre des Bretons, were visited by Europeans long before the valley of the St. Lawrence was discovered by the Breton sailor. Indeed it is contended that the first attempt at European settlement in Canada was on the island of Cape Breton—at St. Peter's or Inganiche; but we need not dwell on this interesting suggestion of the antiquarian, except to say that the Portuguese had no influence whatever on the colonization of the eastern provinces of Canada, and the old town of Annapolis may always point with pride to its grassy hillocks and willow-stumps as so many relics of the days of the French *régime*.

It is in the letters-patent and commission given in 1603 by Henry IV of France and Navarre to Sieur de Monts that we find the first mention of Acadie, which is also described as Cadie, obviously a Micmac or Souriquois affix used in connection with other words to describe the natural characteristics of a place or locality (ăkăde). For instance, Numachwakăde is a place where fish is plentiful; Anagwakăde is White Point; Segubunakăde or Shubenacădie is the place where a root known as the ground nut or Indian potato grows; and so on with any number of places in the old home of the Micmac Indians.[2] The royal papers just mentioned give the French a jurisdiction over "the whole coast of Acadie, the lands of Cape Breton (du Cap Breton), the bays of St. Clair and Chaleurs, the islands of Percé, Gaspey, Mettan [Matane], Tadousac and the river of Canada." Cape Breton, which is not definitely mentioned as an island, but is called after its cape, long remained in obscurity, and it is Port Royal that alone for many years attracted the attention of the historian. The record of this little post in the Bay of Fundy is the record of a never ending conflict between the English and the French for the dominion of Acadie.

According as the New England colonies increased in population, the French possession of Acadie was regarded by them as a constant menace, and all their efforts were, time and again, for more than a century, directed towards driving the French from the country. After the foundation of Quebec by Champlain, Canada became the favourite colony of France, and Acadie obtained a very small degree of recognition from the parent state. At no time, indeed, in her history did she evoke that interest and attention from the French king and people that would have enabled the struggling colonists eventually to hold their own against the energetic and sturdy New Englanders. In 1613 Port Royal surrendered to an English adventurer named Captain Argall, and Acadie remained in the possession of England until the treaty of St. Germain-en-Laye, when it was restored to France with all the countries and places which Great Britain held in New France. While Acadie was occupied by England, a Scotch gentleman, Sir William Alexander, afterwards the Earl of Stirling, obtained a grant from King James of the country which was now called Nova Scotia, as well as of New Brunswick and St. John's Island, of a part of Lower Canada and also of Cape Breton, which was called Baccalaos in his patent; an indication that the present name was not yet generally recognized in Europe. This patent is chiefly interesting to us from the fact that it gave him the right to establish settlements within his grant, to which was appended the title of baronet. In these prosaic, practical days, when everything is brought—too much so in some cases—to the test of commercial value,

[1] See *infra*, sec. IX, and App. IV, for references to a probable survival of this curious name on the south-eastern coast of Cape Breton, in the immediate vicinity of Louisbourg.

[2] See App. XIII to this work for a list of Indian compound words in support of the assertion in the text.

we recall with some amusement the efforts of men in times, when the virgin forest held the mastery in America, to reproduce the titles and trappings of the old world and create a new *noblesse* to gratify the cravings of ambition which could not be satisfied in Europe. On the banks of the St. Lawrence, seigniors held estates of princely magnitude and imitated the feudal customs of their old homes across the sea. On the Hudson, patroons assumed the dignity of great manorial lords, and in South Carolina an English philosopher attempted to create grandees under the high-sounding names of lords-palatine, landgraves and caciques. Even in the little island of Prince Edward, when it had passed away from its first French proprietors, Englishmen had their ambition to become lords paramount, manorial lords and barons.[1] In Acadie, the dignity which was to be attached to grants of land for the encouragement of settlement never took root, and though the title has been long retained in Scottish families as a purely honorary distinction, it has never had since the days of Stirling any connection with the province from which it was named more than two hundred and sixty years ago.[2]

One of the persons who obtained such a right was Lord Ochiltree, who built a fort in 1629 at Baleine, a small port to the northeast of Louisbourg, with the object of colonizing that section of Cape Breton, but he was very soon forced to leave the place by a number of Frenchmen under the leadership of a Captain Daniel, who claimed that the Scotch nobleman was a trespasser on the territory of France. After destroying the English post, the same Captain Daniel built a fort and commenced a settlement at St. Anne's,[3] then called Great Cibou,[4] by the savages. This first attempt to found a French colony on the northeastern coast of Cape Breton was unsuccessful after a few years of struggle. The Jesuit mission, which is said to have existed there in 1634, was withdrawn and the settlement almost deserted two or three years later, when an energetic Frenchman came to the island and established a post in the same place to carry on the fisheries.

The history of Acadie from 1632 to 1713, when it became a permanent possession of England, is one of a never-ceasing contest between the rival chiefs, La Tour and Charnisay, for the supremacy in the country where both of them claimed to have rights. New Scotland, in those days, in fact, was the scene of such feuds as kept rival chieftains for centuries in a state of constant warfare amid the glens and mountains of old Scotland. In Cape Breton an enterprising Frenchman of the name of Nicholas Denys, Sieur de Fronsac, a native of Tours, attempted to establish himself at St. Peter's, on the isthmus between the sea and the Bras d'Or lake, on the southwestern extremity of the island. For many years he also built trading posts of some importance at St. Anne's on the eastern coast of Cape Breton, at Chedabouctou Bay (now Guysboro), and at Miscou on the coast of New Brunswick; but he, too, suffered from the greed and lawlessness of rivals. It was easy enough, in those times, to obtain grants of land and the right to trade in those countries from the authorities in France, who knew nothing of the geography of the new

[1] See Campbell's "History of Prince Edward Island" (Charlottetown, 1875) 20-12; Bourinot, "Local Government in Canada," Johns Hopkins "Un. Studies," Baltimore, 1887.

[2] Murdoch's "History of Nova Scotia" (i. 68-69) gives a description of the insignia of the order.

[3] Ferland, "Cours d'Histoire du Canada," i. 259. This historian (i. 238) falls into the error of confusing Lord Ochiltree's fort at Baleine with the one which Daniel subsequently built at St. Anne's. Murdoch, in his "History of Nova Scotia," (i. 72) also makes the mistake of placing Ochiltree's fort at St. Anne's. See Brown, "History of Cape Breton," pp. 74-84; Champlain, iv. 1283-8.

[4] See *infra*, sec. IX, for meaning of this Micmac word.

world, and took little or no pains to ascertain whether they might not interfere with previous charters. One Le Borgne, who was a creditor of Charnisay, the former rival of La Tour and governor of Acadie, professed to have obtained authority from the parliament of Paris to take possession of all his debtor's property in the colony. He claimed that Denys was an intruder on the domain over which Charnisay had lordship, and in a most high-handed manner took possession of all the property owned by the former at St. Peter's. On appealing to France, Denys obtained a patent in 1654 from the king, appointing him governor of the extensive country extending from Cape Cançeau to Cape Rosiers [Race], Newfoundland, Cape Breton, St. John and other adjacent islands. Hardly had he obtained this redress from the authorities in France, to whom he at once appealed, than he found himself harassed by the lawless conduct of another commercial rival named Giraudière, who claimed to have received from the Company of New France a grant of the coast in Acadie, which included Denys's concession and fort at Guysboro'. The Canadian Company subsequently repudiated Giraudière's acts and revoked their grant to him, but Denys received no compensation for the losses which he suffered at Chedabouctou from his rival's treachery and falsehood. He was compelled to give up his post in Acadie, and to retire to Cape Breton, but even here his misfortunes followed him. At last, when his fort at St. Pierre was destroyed by fire, he retired altogether from the island to the Bay of Chaleurs, probably before 1669, and is believed to have returned to France either in 1671 or 1672, disheartened and worn out by his struggles in America.[1]

Whilst in his native country, Denys published the first book which refers at any length to Cape Breton since its discovery, and gives us some interesting information respecting the natural features of those parts of the island with which he was best

[1] Mr. Hannay, in his history of Acadie, gives a well-written account of this memorable feud which lasted for many years in the early days of Nova Scotia, but he appears to have fallen into some slight errors with respect to Denys and his difficulties with Le Borgne. He tells us (p. 187) that Charnisay broke up Denys's establishment in Cape Breton, whereas it was Le Borgne who laid claim to all the former's rights in Acadie as stated above. When Denys first came to Acadie he established a shore fishery at Rossignol (Liverpool) in partnership with De Razilly, then living at La Have, and a merchant of Auray, in Bretagne (Murdoch, Hist. of N. S., i. 87; Denys, Amérique Septentrionale, i. 86). On account of the loss of his principal vessel he appears to have left Rossignol and established himself in the vicinity of Razilly's fort with the intention of carrying on a lumbering business, but on the death of Razilly, Charnisay obtained a transfer in his favour of all the latter's estates (Murdoch, i. 96) and forced Denys to abandon his enterprise in disgust (Denys, i. 94-104). Denys then established himself in Cape Breton, and after some time was attacked by Le Borgne. Hannay also informs us (p. 194) that the latter destroyed Denys's establishment at La Have in Nova Scotia, but this does not seem accurate. It appears that after Denys went to Cape Breton Charnisay or D'Aulnay, as he is indifferently called, removed the inhabitants of La Have to Port Royal, and according to a French Canadian historian they were the beginning of the French Acadian race (Ferland, i. 351, n.; Murdoch, i. 103, 114; Denys, 4). La Have, it seems, was again settled after Charnisay had removed the original inhabitants, and Le Borgne's party, after their attack on Denys in Cape Breton, and on their way to Port Royal with him as a prisoner, destroyed the houses, not because Denys had any claim to them, but apparently because Le Borgne did not recognize the right of the new people to occupy the place. (Murdoch, i. 125; Denys, i. 6.) Subsequently Denys obtained his liberty and acknowledgments of his rights, while Le Borgne's son took possession of La Have and constructed a fort of timber for the purpose of carrying on business at that point (*Ibid*, i. 10). The letters-patent of 1654, defining Denys's limit of government (Brown, 92, Quebec Doc., i. 141) speak of Charnisay having expelled him from his forts, but this must be a mistake for Le Borgne or a reference to Charnisay having driven Denys from La Have. Denys, however, is remarkably obscure in narrating even the facts of his own history, and it is easy to understand why Brown, Hannay and others are often perplexed and misled. I have endeavoured to study out the facts with the results as I have given them above—hesitatingly, I admit.

acquainted.[1] But whenever he takes up subjects of which he has no personal knowledge, his statements are very perplexing on account of their vagueness. We can see throughout the book, however, that he had much confidence in the capabilities of the island, and deeply regretted that his misfortunes had prevented him from carrying on the enterprises which he had in view for its settlement and development. During his residence in Cape Breton, he tilled not only the land around his post at St. Pierre, but had a fine settlement at St. Anne's, where he cultivated even fruit successfully. Consequently he was able to write with some knowledge of the resources of Cape Breton. His departure was a serious blow to the island, which remained for years neglected by his countrymen. Not a single European settlement was made within its limits until the first years of the eighteenth century, while the total population of Acadie itself did not reach a thousand souls, including the little garrison at Port Royal. Denys appears to have been in Quebec in 1679, for there is documentary evidence[2] to show that he was blind at that time and was pressing his claims for consideration on the government and asking an appointment of master of forests for his son, very likely the father of that M. de la Ronde Denys, whose name sometimes occurs in the later records of the island when Louisbourg was founded and Isle Royale became at last a valued possession of France.[3]

II. Cape Breton as Ile Royale, and the foundation of Louisbourg.

During the seventeenth century it was a question whether Acadie was destined to be an English or a French colony. At times the red cross of England, and at others the Bourbon lilies were raised over the little fort at Port Royal, and it was not until the victories of Marlborough had humbled the pride of the great monarch, and crushed the armies of France at Blenheim, Ramilies and Oudenarde, that the country now known as Nova Scotia and New Brunswick, passed forever into the possession of England. The treaty of Utrecht[4] was the first check given to France in her designs to colonize America

[1] See App. IX (first paragraph) to this work, for a bibliographical notice of this very rare book. I give also, in App. VIII, a translation of the chapter referring to the island specially, as it has never before been printed in English. It shows that Denys had only a superficial acquaintance with the geographical and natural features of the island generally. His knowledge was confined to St. Peter's, the Labrador and the coast between Inganiche and Cape North.

[2] Quebec Documents, i. 273.

[3] M. de la Ronde Denys, grandson of the old governor, a captain of infantry, who took part in the settlement of Cape Breton in 1713, sent a description in that year to the French minister having charge of the colonies, in which he calls St. Anne's the finest harbour in the world, and presses its advantages over any that Louisbourg could offer as the chief port and fortified place. "My devoted grandfather," he wrote, "had a fort there, the remains of which are yet to be seen, and the Indians tell us that he raised the finest grain there and we have likewise seen the fields which he used to till; and there are to be seen in the place very fine apple trees, from which we have eaten very good fruit for the season..... We see by experience, my lord, that New England, which is not worth a tenth part of Cape Breton, how that colony flourishes; for I know of certain knowledge that there are built in the county of Boston, every year, more than 1500 vessels, from 15 tons up to 800 tons burthen. One sees that there is nothing to hinder us doing the same thing. We are deficient in nothing required." It is quite true that when we look at Cape Breton, with its unrivalled situation for the successful prosecution of the fisheries, its remarkable mines of bituminous coal, and its relation to the rest of the continent, we can well believe that its natural advantages are far superior to those of the New England States; but its want of wealth, capital and enterprise and of connection for many years with a great and prosperous country like that to the back of New England, have kept the island always in a very inferior position until the present, when its prospects at last seem brighter.

[4] For text of this treaty so far as it relates to Cape Breton, see App. XVI to this work.

and the inauguration of that series of victories which ended at last in driving her entirely from the continent. "At the time of the Armada," says an English historian, "we saw England entering the race for the first time; at Utrecht, England wins the race. . . . The positive gains of England were Acadie in Nova Scotia, and Newfoundland surrendered by France, and the Assiento compact granted by Spain. In other words, the first step was taken towards the destruction of greater France by depriving her of one of her three settlements of Acadie, Canada and Louisiana, in North America. From that moment the rivalry in America is between France and England. . . . The decisive event of it is the Seven Years' War and the new position given to England by the treaty of Paris in 1762. Here is the culminating point of English power in the eighteenth century; nay relatively to other states, England has never since been so great."[1]

Cape Breton, from this time forward, commenced to be an influential factor in the affairs of New France. Before the close of the war and the cession of Nova Scotia and Newfoundland to England, the attention of the French government was directed to the importance of the geographical position of the island and to the expediency of making one of its harbours an *entrepôt* for the trade between Canada, France and the West Indies. M. Raudot, intendant of justice and police, and his son, who had charge of finance in Canada, recommended, in 1708, that the island should be made available for commercial purposes, and very strongly pressed the necessity of fortifying one of its harbours, which "would afford a safe refuge for vessels chased by an enemy, driven in by storms or in want of provisions." Such a harbour would, in their opinion, "form a suitable rendezvous for cruisers and privateers, while France might monopolize the codfishery on the coast of Acadie by means of a few small frigates, always ready to drive off foreign fishermen."[2] So far the island had been neglected, and Plaisance—the Placentia of the Portuguese—was the headquarters of the French fisheries in the Gulf of St. Lawrence. At this time Newfoundland was inhabited by a considerable number of English traders and fishermen, chiefly on the coast between Cape Race and Cape Bonavista. Both the French and English had now a large fleet of vessels of considerable size engaged in these rich fisheries, the annual catch of the French alone being probably half a million quintals. When Newfoundland was given up to England in 1713, the French officials and inhabitants removed to Cape Breton, where English Harbour, from that time known as Louisbourg, was chosen as the capital. The island itself was named Ile Royale, St. Peter's became Port Toulouse, and the fine port of St. Anne became Port Dauphin, and seemed likely at one time to be chosen as the seat of government. The first governor of Ile Royale was M. de Costabelle,[3] who had held a similar position at Plaisance, in Newfoundland. The

[1] Seeley, "Expansion of England," pp. 132, 133, 138.

[2] For a very full abstract of this able memorandum of the Raudots, see Charlevoix, "Histoire Générale de la Nouvelle France," iv. 129-142.

[3] The following is a list of the French governors of Ile Royale from 1713 to 1758: M. de Costabelle, 1712-1717; M. de St. Ovide, 1718-1735; M. de Brouillan, 1736-1738; M. de Forant, 1739-1740; M. Duquesnel, 1741-1744; Major Duchambon, 1745; [the English governors from 1745 to 1749 were Warren and Pepperrell (joint), Commodore Knowles and Colonel Hopson;] M. des Herbières, 1749-1751; M. le Comte de Raymond, 1751-1754; M. d'Aillebout, 1754; M. de Drucour, 1754-1759. This list is made up from M. Marmette's summary of papers in the French archives relating to Ile Royale. ("Canadian Archives," 1887.) M. de St. Ovide was also known as M. de St. Ovide de Brouillan, and it is a question whether the same person was not governor from 1736 to 1738, but I have not been able to clear up this doubt.

island, in the course of years, received small accessions of population from Acadie, but, generally speaking, the inhabitants of that country showed little disposition to remove in any number to the island which France now began to value since she had lost so much by the treaty of Utrecht. It is interesting to note that in the negotiations that preceded this treaty England was desirous of holding Cape Breton in common with the French, on condition that neither power should raise fortifications on the island. If this proposition had been agreed to, we might have had in these days some such complications as have arisen from the unfortunate clause in the treaty which gives the French certain fishing rights on a portion of the coast of Newfoundland, to the great irritation of the people of that island, who are now suffering from the consequences of the blunder on the part of English statesmen, quite indifferent to colonial interests in those early times. The French government, however, not only succeeded in hampering the future development of Newfoundland, by obtaining this important advantage for their fishing interests, but they refused to agree to the proposition which was made by Saint John, afterwards Lord Bolingbroke, partly on the ground that as it was desirable "to establish a perfect good understanding" between France and Great Britain, "it was impossible to preserve it in the places possessed in common by the French and English nations;" but the chief reason was no doubt the one also urged that it was prudence on the part of the French King "to reserve to himself the possession of the only isle which will hereafter open an entrance to the river St. Lawrence." In this way, by the foresight of the French, Cape Breton was spared the troubles that might have arisen had the English suggestion been hastily adopted, and the treaty of Utrecht finally provided that this island, "as also all others both in the mouth of the River St. Lawrence and in the gulf of the same name, shall hereafter belong of right to the king of France, who shall have liberty to fortify any place or places there."

That we may understand the importance of Cape Breton in the contest between France and England for dominion in America it is necessary that we should survey the state of the colonies of the two nations on this continent. The English settlements extended from the Penobscot to the Spanish colony of Florida and were confined to a narrow range of country between the Atlantic and the Appalachian range of mountains. When George the First ascended the throne of England, soon after the signing of the treaty of Utrecht, the total population of these colonies had reached 375,750 white inhabitants, and 58,850 blacks; in all, 434,600 souls, and was increasing with great rapidity. Their commercial activity and industrial enterprise had already created a total annual trade of imports and exports, probably to the value of twelve millions and a half of dollars.[1] The colonies of Massachusetts (which then included Maine), New Hampshire, Rhode Island, Connecticut, New Jersey, Maryland, Delaware, Pennsylvania, Virginia and the Carolinas (then comprising Georgia) enjoyed representative institutions based on those of England, and local government in a very complete form. New England from its natural situation had, since its early settlement, watched with jealousy and dread the growth of the French settlements in Acadie and Canada, and when their villages were destroyed and their people massacred from time to time by the raids of Indians and French, they were nerved to make powerful efforts to seize Quebec and Port Royal. Phipps made an abortive attack on the ancient capital of Canada in 1690, and Admiral Sir

[1] Hildreth, "Hist. of the U. S.," ii. 278, 329. Bancroft "Hist. of the U. S.," ii. 238.

Hovenden Walker never succeeded (1711) in getting beyond the mouth of the St. Lawrence, but after a loss of eight transports and nearly nine hundred men decided to give up even the project of attacking the little French post of Plaisance and to return to England.[1] The whole expedition was destined to failure from the very start, as the chief command of the veteran regiments which had followed Marlborough to victory on the continent of Europe was actually entrusted to a notoriously incompetent brother of Mrs. Masham, who had supplanted the famous Duchess in Queen Anne's affections. The Duke had refused to give him a coloneley on the ground that he was a "good for nothing,"[2] but court favour foisted him, at last, upon an expedition whose issue reflected disgrace on all concerned in it and sadly discouraged the English colonists who were looking forward anxiously to its success. Their hopes had already been considerably raised by the advantage previously gained by General Nicholson—an able man long connected with the government of the colonies—who succeeded in 1710 in taking possession of Port Royal.[3] From that time Acadie ceased to be a French possession, and the people of New England felt that the first step had been taken towards ridding themselves of a dangerous neighbour in America. Half a century, however, would pass before all their hopes could be realized and England reign supreme in the valley of the St. Lawrence.

[1] It appears that Sir Hovenden was forced by public opinion in England to retreat to South Carolina and to write a book in his defence:—"When I perceived myself unworthy to serve my own nation any longer [see p. 21 of his Journal of the Expedition] I thought it more consistent with my principles, and indeed more honourable to retreat to the most distant part of the King's dominions, and pass the rest of my life in a private state of solitude and retirement." In concluding his apology or defence (see App. XV to this work) he consoles himself with this poetic outburst:—

To conclude.

"How thoughtless is the Man, and how unblest!
Who suffers Fortune to invade his Rest:
Who vainly grieves at Injuries of Fate,
Which eases none: But does more Ills create:
Fondly pursuing Methods, for Redress,
Which ruffle, and destroy his inward Peace.
Man is a world, and to himself can be,
The Seat of Happiness, or of Misery:
Whose reason, is the Monarch of his Mind,
And uncontroul'd should rule and unconfin'd;
What boots it then, tho' fickle Chance deprives,
Of outward Benefits, Chance only gives?
Tho' all the States on Earth should be at Jars
Involv'd in foreign, or intestine Wars;
While his small Kingdom, undisturb'd shall be,
From civil Discords, and rude Tumults free;
Fortune's Insults, he'll treat with just Disdain,
And she'll attempt his settled Peace in vain.
Let him secure a calm Repose within,
He's safe: For Sorrows only then begin,
When headstrong Passions dare rebellious prove,
And reason from the Throne, by Force remove."

[2] Bancroft, "History of the U. S.," ii. 200, 201 (N. Y., 1888, author's last ed.).

[3] The French Governor Subercase, who surrendered Port Royal to General Nicholson, had a commission from the French king as "Governor of Acadie, Cape Breton and the adjacent islands and countries." By his surrender then Cape Breton came also into the possession of England until 1713, when France awoke to its importance. Douglas, "Summary of the British Settlements," i. 345-346; Murdoch, "Hist. of Nova Scotia," i. 318.

Realizing, at last, the serious mistake they had made in neglecting the defences of Acadie, the French government, after a few months of hesitation—quite intelligible in view of the disasters of the great war—set to work to adopt the wise advice of the Raudots in 1708 and to make Louisbourg a centre of trade on the Atlantic coast, and a bulwark of their dominion in Canada. Unlike the English colonists, the French on the St. Lawrence enjoyed no political liberties, but were governed by an aristocratic, illiberal system which crushed out every semblance of self-government and placed them entirely under the rule of the king and his officials in the province. Their only trade was in furs, and the country gave no evidence of that commercial enterprise that distinguished the English colonies, where ship-building, the fisheries and tobacco cultivation were among the staple industries. In 1714 there were only two towns of any importance in Canada, Quebec and Montreal, and their total population did not nearly equal that of Boston. The whole population of Canada did not exceed twenty-five thousand souls, or about one half that of Massachusetts, of which less than five thousand were capable of bearing arms. Although the commerce and population of Canada were insignificant in comparison with the English colonies, the French governors were ambitious to extend French dominion in America. Men like Joliet, Marquette and La Salle represented the spirit of enterprise which carried *coureurs de bois*, missionaries, traders and gentlemen-adventurers into the mysterious west which Frenchmen had discovered and explored forty years before Governor Spottiswood and his gay following of Virginia gentlemen had crossed the Blue Ridge and saw the beauty of the Shenandoah Valley. The only practical result of that holiday trip of an English cavalier was the presentation of a pretty golden horseshoe to the gallant gentlemen who, in honour of the occasion, were named the "knights of the golden horseshoe";[1] but La Salle actually explored the country of the Illinois, descended the Mississippi and gave to France the right to claim that great valley, which is now the home of many millions of people, inhabiting a rich country which seemed, at one time, destined to become a part of a mighty French empire in America. When the House of Hanover gave a king to England, there were already French posts and missions at important points on the great lakes and in the northwest, discovered by the French explorers during the closing years of the seventeenth century: at Frontenac, on the head of the St. Lawrence River; at Detroit, between Lakes Huron and Erie; at Ste. Marie, between Lakes Huron and Superior; at Mackinaw (Michillimacinac), between Lakes Huron and Michigan; at Fort Miami, on the St. Joseph at the foot of Lake Michigan; at St. Louis, on the Illinois; at Kaskakia, on the upper Mississippi; at Mobile, on the Gulf of Mexico.[2] These posts were the evidences of France's growing power in North America, the first steps towards the realization of that ambitious policy which, in the middle of the eighteenth century, laid claim to the Ohio Valley and attempted to confine the English colonies between the sea and the Alleghanies.

The fortifications of Louisbourg[3] were commenced in 1720 and cost the French nation thirty millions of livres or about six million dollars, or taking into account the greater

[1] See Cooke's "Virginia," in the American Commonwealth Series (Boston, 1884) pp. 314, 315; Hinsdale's "Old Northwest" (N.Y., 1891) i. 17, 18; the latter quotes Waddell's "Annals of Augusta Co.," pp. 6-9.

[2] For a brief sketch of the colonization of the Northwest, and the establishment of a chain of fortified posts between the lake country and the settlements on the St. Lawrence, see Hinsdale's "Old Northwest," i. 38-54.

[3] See large plan of the fortifications appended to this work.

value of money in those days over ten million dollars of our money, and even then they were never completed in accordance with the original design, on account of the enormous expense which far exceeded the original estimates, and of the reluctance of the French king to spend money in America when it was required to meet the lavish expenditure of mistresses and the cost of wars of ambition in Europe. The walls of the fortifications were chiefly built of a porphyritic trap—a prevailing rock in the vicinity.[1] A considerable

French Medal struck at foundation of fortifications of Louisbourg.[2]

portion of the finer materials used in the construction of the brick and stone masonry of the fortifications and buildings was actually brought from France,—as ballast probably in the fishing fleet from year to year—but it is also well known that a good deal of the timber and brick was purchased from traders of New England who had no objection to earn an honest penny, even among a people whom they at once despised and hated, and some of whom, in all probability, helped at a later time to demolish the very walls for which they had furnished materials.[3] It is stated with such persistence by French officers, that we must believe that there is some truth in it, that the fortifications had been constructed carelessly and worthless sea sand used in mixing the mortar. It is quite probable that in Louisbourg, as in Canada, the officials in charge of the works cheated the government in every possible way in order to amass enough to get out of the country to which many of them had a strong aversion.

[1] Dr. Gesner's "Industrial Resources of Nova Scotia," p. 308. "The quarry," he is writing of a visit to the ruins in 1849, " is seen about half a mile from the town. The stones were employed in their rough state. With them I found a handsome cut rock, closely resembling the Portland stone of England. I have been informed that this rock was obtained by the French at Mira River, but I have never seen any like it in America. Pieces of fine polished marble were also found among the ruins of the governor's dwelling." See App. XVI to this book for a reference to Dr. Gesner's work on Nova Scotia.

[2] From the collection of Mr. McLachlan, Montreal. See App. XII to this work.—No. 1 in list.

[3] The New England merchants were always ready to take advantage of their position and make money out of England and France according to existing circumstances. Sir Hovenden Walker, admiral of the fleet that met with disaster in 1711, while in the Gulf of St. Lawrence on the way to attack Quebec, (see *supra* sec. XI) tells us in his account of the ill-fated expedition, that while in Boston, for the purpose of obtaining supplies, Mr. Belcher, a rich and leading man of the province, refused to continue his contract to furnish provisions, because he could not get the exorbitant prices he asked. (See pp. 64, 65 of Journal.) Some of the captains of the ships expressed the opinion that " Belcher designed to buy up all the provisions to be had in the country to enhance the prices and so make the whole advantage to his own private interest." Mr. Peter Faneuil—a famous name in Boston still—was also remarkable for " the exorbitance of his prices." (See pp. 11, 12 of Journal.) Puritan and Profit appear to have been often synonymous terms in the early history of New England.

The harbour of Louisbourg lies on the southeastern coast of Cape Breton and is a port very easily made by vessels coming from Europe. The cape from which the island takes its name, and which was always the landfall anxiously looked for by the Breton, Basque and English mariners in the old times to which I have referred, lies only about two leagues in a northeasterly direction from the most easterly point of the harbour where a lighthouse has always stood since the days of French occupation. The harbour runs from southwest to northeast and has a length of about two miles and an average width of half a mile. It has a depth of from three to six fathoms of water, and affords safe anchorage at all seasons for a large fleet of vessels. It is rarely blocked by drift ice compared with other ports on that coast of Cape Breton and is open all winter, the little northeastern harbour being the only part frozen. It has a remarkably easy entrance from the sea of probably a third of mile in width between the rocky shore of Lighthouse Point and a chain of islets and rocks which form an impassable barrier to any approach from the ocean to the oblong neck of land on the southern shore of the port, where the fortified town of Louisbourg was built by the French. This point rises gradually from the harbour and forms a slight acclivity where the buildings stood, and then gently declines into the low ground, made up of swamp, rocky knolls and scrub, which lies between it and the great bay of Gabarus, which stretches to the southwest for a distance of from a mile and a sixth to four miles from the fortifications, White Point being the nearest and Freshwater Cove the furthest in this direction. At the southwest extremity of the harbour there was and is still a little barachois—a name generally given to a pond connected with the sea,—while the port narrows towards the northeast and forms an arm between the western shore and a rocky promontory, covered with scrubby spruce, averaging from a mile and a quarter to half a mile in width. This sheltered arm has been always the favourite anchorage of the fishing boats and schooners from the earliest times. On the most prominent point of the promontory, at the entrance of the harbour, stands the lighthouse, from which a most magnificent view of the Atlantic can be had on a clear day. On the northeast side the French had a careening wharf where men-of-war could heave down and be repaired. On the opposite shore there were a large number of rude stages where the fishermen made their fish. The shore of the promontory is exceedingly rugged and precipitous in places, but between the lighthouse point and Cape Breton there are three picturesquely formed coves or small harbours, which have been always the resort of fishermen, and one of which is memorable as having been the scene of Lord Ochiltree's abortive attempt to establish the first British colony on the island. The western side of the harbour has a very gradual ascent into the interior of the island, and was covered with a thick grove of small spruce, except where it had been cleared to make room for batteries and buildings and to prevent a cover for an attacking force too close to the town. The hilly country, which practically commands the town on this side of the port, stretches as far as Lake Catalogne, and beyond to the beautiful river and bay of Mira, a distance of about twelve miles. On this river, in the course of time, French people had comfortable farms and even gardens, and here and there the visitor can still see the narcissus growing among the ruins of their old homes and the stumps of old apple and plum trees which had been evidently planted by these early inhabitants of

the island.[1] On the same river there was also a settlement of Germans, probably from Alsace-Lorraine.[2]

The fortifications enclosed an area of over one hundred acres, and had a circumference of about two and one-half miles. They were planned on the best system as laid down by Vauban and other great masters of engineering skill, and were intended to be, as indeed they were, despite their faulty construction, the most complete example of a strongly fortified city in America. Writers have constantly referred to Louisbourg as "the American Dunkirk," and it is no exaggeration to say that its fortifications can be best compared to that powerful fortress which was for so many years a menace to England on the French coast. The strongest portion of the fortifications was necessarily constructed on the land side, stretching for two-thirds of a mile from the Dauphin or west gate at the northwesterly angle of the walls or the southern shore of the harbour to within a short distance of the rocky shore at Black Point, and facing the country which stretches to Gabarus Bay,—necessarily the weak side since any attack by land must come from that direction. If we survey the general features of the fortifications, as set forth in the plans and descriptions which have come down to us, we find that the glacis was perfect on the southwest, or land front, as far as the shore extremity of the walls, and a ditch at least eighty feet in breadth extended throughout this distance. An escarpment rose above this ditch, but it was necessary to cross a bridge over a little stream before entering the west or Dauphin gate, which was protected by the Dauphin bastion and a circular battery mounting sixteen 24-pounders. Following the walls we come next to the King's bastion and citadel, which was protected by the glacis, a covered way, and a moat connected with the town by a drawbridge. The citadel was a long, oblong building of stone, and contained apartments for the governor, a barracks and a chapel. In the bastion there were also an arsenal and a magazine, a place d'armes and a parade. Passing on for about five hundred feet, we come to the Queen's bastion, and midway between it and the Princess's bastion was the Queen's gate, which connected the town with the place d'armes at that point by a bridge over the ditch. The Princess's bastion formed the defence of the extreme southwestern point of the wall, facing the rocky shore. From this point, for a distance of about two hundred yards, the defences consisted only of a rampart for small arms and a palisade, the rocky shore and shallow water being here well covered by the fire of the bastions. In

[1] James Gibson, who belonged to Brigadier-General Waldo's regiment in 1745, gives an account in his journal (see App. X to this work) of two fine farms on a neck of land in the west-northwest part of the island, about twenty-five miles from the Grand Battery. "First we came to a very handsome house, with two large barns, two large gardens and fine fields of corn. * * * The other was a fine stone edifice, six rooms on a floor and well furnished. There was a fine walk before it, and two barns contiguous to it, with fine gardens and fields of wheat. In one of these barns were fifteen loads of hay, and room sufficient for sixty horses and cattle." As Gibson speaks of a house "situated at the mouth of a large salmon fishery," Brown ("Hist. of C. B.," p. 222*n*) is probably right in his conjecture that the farms were situated near the confluence of the Mira and Salmon rivers—a fertile and beautiful country.

[2] Writing to the French minister in 1753, M, Prévost, the intendant, has the following remarks on the subject: "I had the honour of announcing the location of the German village on the border of the Grand Lake of Mira. It is there Count Raymond told me he wished to place it, but I have since then indirectly heard that the settlement had been changed to the grand Mira road, one league from the lake and at the foot of the Devil's Mountain. I hope I am wrong in this particular, but it is in the knowledge of everybody that the poorest land for the purpose has been chosen, and the grant of one arpent [nearly two English acres] as frontage to each lot is far too narrow." See "Correspondance Générale, Archives Coloniales de la Marine" (Paris), vol. xxxiii, c. 11, fol. 100.

the siege of 1745, however, it was considered necessary to add a picquet line for additional defence. The Maurepas and Brouillan bastions protected Rochefort Point, from which stretched to the southeast the rocks and island which guarded the harbour from the ocean. Beyond the Maurepas bastion there was a large pond, over which was built a long bridge of timber, communicating in a northwesterly line with the battery de la grève, which mounted ten guns and was the most important work on the harbour front of the town. The beach between the latter battery and the Dauphin bastion formed a little cove, which was protected by the cross-fire from those points, and over which stretched a boom in 1745 to guard against fireships and to prevent the English from landing from boats on that side of the town. The wall around this cove was made of stone and earth, with a banquette and parapet for the use of musketeers. Here there were four gates communicating with the shore, chiefly for the purpose of bringing in supplies. Close by, within the walls, were the ordnance and general storehouses of the town. Accounts vary as to the number of cannon that were actually mounted within the circuit of the walls, but there were at the time of the first siege in 1745, embrasures for one hundred and forty-eight guns, and at the time of the second attack, thirteen years later, additional defences, including a battery of twenty-four guns, were erected at Rochefort Point. The town itself was well laid out in regular streets, six running east and west and seven north and south, crossing each other at right angles. A fine hospital and nunnery, built of stone, stood about the centre of the town. Connected with the hospital of St. Jean de Dieu was a small chapel. The residences of the people were generally small wooden structures on brick or stone foundations from six to seven and a half feet from the ground. "In some houses," says one writer who was in the town in 1745, "the whole ground floor was of stone and the stories of wood."[1]

If we are to judge from a return of the buildings used by the military establishment in 1753,[2] the accommodation for officials of the government and the officers and soldiers of the garrison was in many ways unsatisfactory. The barracks and officers' quarters were too small and otherwise inadequate. In a place of the importance of Louisbourg, one would expect to find all the public buildings constructed of solid masonry, and every means taken to render them as safe as possible in times of war. The return in question shows, however, that the public buildings erected by the French themselves were for the most part of stone masonry, and that the wooden and other structures of a flimsy character in the town had been hastily erected by the English while in possession of the place from 1745-49. In most cases these buildings were allowed to remain in use until 1758, when the guns of the besiegers made sad havoc in the wooden erection known as the English barracks. Shingles were largely used on the roofs of public as well as private buildings, and the dangers of the inhabitants in times of siege consequently increased to a criminal degree. As a matter of fact, Louisbourg appears to have been a town which, in its original design, was intended to be a place of impregnable strength, but which, through the parsimony of the French government, and the mismanagement and dishonesty of officials, had not realized the ideas of its founders in point of security.

[1] "A Voyage to South America, etc.," by Don George Juan and Don Antonia de Ulloa, (see *infra*, sec. V, and App. X to this work), the latter of whom describes Louisbourg in 1745.

[2] See App. XVII to this work for an official (French) enumeration of the officers' quarters, barracks, guardhouses, powder magazines and other houses connected with the military establishment of Louisbourg in 1753.

The fortifications were indeed only completed a year or so before 1745, and then, after it was given up by the English in 1748, it was in the possession of the French only ten years. Under the circumstances there must have been always a considerable uncertainty as to the future of the town, and the merchants who frequented it could hardly have gone to any heavy expenditure in a place of which they expected to make only a temporary home. During the years it was in the occupation of the French, there were probably, on the average, nearly two thousand people living in the town, but this number was increased in the time of war by the inhabitants of the surrounding country—Gabarus, Mira and Lorembec—who came there for protection. The garrison, in time of peace, reached one thousand men, and in addition to the force there was a detachment of troops stationed at the royal battery, one at the island battery, one at Port Toulouse and another at Port Dauphin. The island battery just mentioned consisted of thirty-two forty-two pounders, and protected the entrance of the harbour. The royal or great battery was situated on the western shore of the harbour, immediately facing the entrance, and was quite a formidable work, constructed with a moat and bastions on the land side, and mounting forty-four guns, twenty-eight of which were forty-two pounders. Both these works were intended to be important auxiliaries in the defence of the town, and had not the royal battery been suddenly deserted at the very commencement of the siege in 1745, the fortress would hardly have fallen so easily before the attack of Pepperrell and his men.

III. Government and State of Cape Breton during the French Régime.

The government of Cape Breton was modelled on that of Canada, to which it was subordinate, and consisted of a governor, generally a military man, a king's lieutenant, who was also commander of the forces, of a commissary, of an attorney-general, and of four or five councillors. These officials formed a governing body known as the superior council, which had also jurisdiction over the island of St. John, now Prince Edward Island. The governor was the president of the council, but, while he was nominally supreme in military affairs, he was controlled in financial matters by the commissary, who had also charge of the military chest and of all the military stores. This same officer had jurisdiction over the administration of justice, in accordance with the ordinances of the king and the parliament of Paris. An inferior court known as the bailiwick tried civil suits and breaches of the peace, in accordance with the *coutume de Paris*, but the high court of justice in the colony was the council, to which appeals could be had in all cases, though their decisions might be reversed on reference to the supreme council in France. Grants of land were made in accordance with the king's instructions by the governor and commissary. The members of the council, exclusive of the officials, were generally chosen from the leading persons of the colony. A court of admiralty, composed of a lieutenant, the attorney-general and a couple of minor officials, acted as a customs' establishment, where the merchants entered their goods and where any infractions of the port regulations could be punished by confiscation or fines. Justice, however, appears to have been loosely administered, since the officials were very inadequately paid and had no means of executing their decrees. One writer complains that "there was not even a common hangman, nor a jail, nor even a tormentor to rack criminals or to inflict penal tortures." The writer in question, Thomas Pichon, who lived for some years in the town as secretary to

Count Raymond when governor of the island, does not express a favourable opinion of the mode in which the affairs of the colony generally were conducted; but while he is obviously prejudiced in his comments, especially against the clergy and religious orders, one who remembers the peculation and jobbery prevalent for years in Canada during the closing years of the French *régime* may well believe that the officials at Louisbourg were equally corrupt, especially when we know that the commissary at Louisbourg for some time was Bigot, whose financial administration subsequently at Quebec nearly ruined the Canadian province at a time when it required all its resources to meet the great crisis in its history.[1] As was always the case in Canada, there was a constant conflict of authority between the governor and the commissary or acting intendant in Louisbourg, whose respective powers appear to have been arranged for the special purpose of creating difficulties and making one a spy upon the other. The fact that the government of Cape Breton was subject to that of Canada did not help to maintain an orderly and peaceful state of things, since in case of dispute weeks and months generally elapsed before a decision on the point at issue could be obtained from the vacillating authorities at Quebec. Pichon gives us some examples of these divisions between the two chief officials. "Whatever the governor proposed," he says in one place, "was sure to be contradicted by the commissary. The latter used to deny that the case was so urgent as to require his compliance; neither would he, without an express order, deliver out the public money, which he has generally in his custody. In the meantime the fortifications were neglected, and a dangerous enemy was ready and able to take advantage of our divisions; so that before the quarrel between the two rivals in ambition, authority and interest could be decided, the proper precautions were likely to come too late." Though one could hardly blame the commissary for refusing to pay public money except on an express order from the nominal head of the government, it is certain that there was great looseness in the conduct of public affairs as well as a decided conflict of authority among those in office. Unhappily, too, for the colony, the officers of justice were often appointed without reference to their legal qualifications. When they were not military men, they were chosen from the inhabitants according to the caprice or favouritism of the governor and intendant, who had joint control over such appointments. At one time, for instance, the judge of the admiralty, who was also the judge of the inferior court of justice, had been a "journeyman wigmaker." It is quite easy to believe, then, that "this magistrate and the others of subordinate jurisdiction grew extremely rich, since they are interested in different branches of commerce, particularly the contraband."

The religious wants of Louisbourg and of other parts of Cape Breton were under the ministration of a number of missionaries, some of whom laboured for years among the Micmacs, when there was probably not another white man on the island. In addition to the priests, there were at Louisbourg some members of a religious community in charge

[1] "With the fall of Louisbourg, where he had acted as commissary, etc., coincides very closely the arrival in Canada of Intendant Bigot, who, by his shameless robberies, prepared the way to the abyss of ruin into which New France was to be precipitated eleven years later. This degraded being would seem to have inoculated his subordinates with all his own vices as soon as he reached Canada; for, previous to his coming, we find again and again in the letters of the governors and intendants reference to the probity and zeal of Varin, Morin, Martel and others, all of whom were afterwards the accomplices of the infamous intendant." See Marmette in "Canadian Archives," 1887, cxxxv.

of the hospital, as well as several nuns belonging to the Congrégation de Notre-Dame,[1] which had been founded by the pious Sister Bourgeoys in the infancy of the Canadian colony, for the education of young girls[2] The hospital brothers also acted as physicians for the whole community in the absence of any regular doctors and druggists, apart from the surgeons of the troops. No mention is made by any writer of schools for the children, of whom there must have been a considerable number since there were, at least, between three and four thousand people in the island at one time and another from 1748 to 1758. In all probability, in Cape Breton as in Canada, education was exclusively in the hands of the priests and the religious orders.

The codfishery was of course the staple industry of the people, and was carried on chiefly at Louisbourg and the adjacent bays. During the French occupation, New England fishermen were also largely engaged in the deep sea fisheries, and had for years a depot at Canseau, and many of them were in the habit of selling their cargoes to the French, although it was contrary to the French regulations. Nearly all the staple articles required for the use of the colony were brought from France. Before the place fell into the possession of England in 1758, the anticipations of the Raudots were in course of realization, and Louisbourg was obtaining some importance as a port of call for the West Indian and Canadian fleets. In the autumn of 1744, the fleet that sailed from Louisbourg consisted of three men of war, six India ships, thirty-one other ships, nine brigantines, five "snows"[3] and two schooners, mostly engaged in the West Indian trade. A small trade also grew up between Louisbourg and the West Indies and the ports of Boston and New York, although both the English and French governments prohibited direct commercial relations between the island and their colonies, since it was the practice of those days to confine all commerce to the vessels of their own nations. The French authorities on the island, however, for their own reasons, winked at an illicit trade in fish and various articles of English and colonial production, and a good deal of smuggling was carried on for years at Louisbourg and other ports of Cape Breton. Sugar, coffee and tobacco from the French West Indies, and wines and brandy from France, found their way on board New England vessels in exchange for codfish, brick, boards, meal and various colonial commodities. As early as 1725 we find there were a number of New England vessels carrying on this trade regularly with Louisbourg. One of them, we read, took a whole cargo of claret and brandy for the use of the people of New York, who were, even in those days, as fond of good living as they are now.[4]

The value of the fisheries and commerce of Cape Breton necessarily varied from year to year on account of the constantly recurring wars between France and England, and the consequent derangement of trade in the French possessions in America. Elsewhere[5] will be found some interesting details of fisheries and trade gathered from official sources of information in Paris. The French government took great pains to obtain regular

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[1] This congregation, whose parent house is still in Montreal, has now branches at Sydney, Arichat and West Arichat or Acadiaville. (See *infra*, sec. X.)

[2] See Faillon, "Histoire de la Colonie Française en Canada" (Montreal, 1865), ii. 284-286.

[3] A "snow" is described in the nautical dictionaries as "a vessel equipped with two masts resembling the main and foremasts of a ship and a third small mast just abaft the main mast, carrying a sail nearly similar to a ship's mizzen." But Preble (New Eng. Hist. and Gen. Reg., 1868, p. 396) says the largest two-masted vessels were sometimes called "snows" or "galleys."

[4] Murdoch, "Hist. of N. S.," i. 430.

[5] See App. XVIII to this work.

reports from its officers in America of everything touching the government, and the social, religious, and commercial condition of every one of its colonies, including Cape Breton. One estimate of the Cape Breton fisheries—a "supputation," as it is called in the French document—obviously from an English source, gives 560 as the total number of brigantines, shallops, and other craft, and 3,400 as the total number of men employed in that branch of business in Cape Breton, previous to the taking of Louisbourg in 1745. The total quantity of fish yearly made in the island is estimated at 186,000 quintals, valued at about £93,000 sterling. The total value of the fisheries of the Gulf and Newfoundland, more or less dependent on the possession by France of the Island, and the maintenance of a strong fortress at one of its ports, is given at £981,692.10 sterling. At the time in question, it was estimated by the same authority that there were at least 414 vessels and 24,520 men engaged in the Gulf fisheries, and that the value of the annual catch was probably £1,152,000 sterling. This estimate is evidently calculated with a view to give the English government the most favourable view of the importance of Cape Breton, and to prevent them restoring it to the French.[1] The official statements of the French, now accessible in the French archives, do not bear out the large estimate just mentioned. The official report of 1753[2] to the French government gives the following statistics of the value of the fisheries and trade of Cape Breton in that year :—

THE FISHERIES.

Vessels of all classes employed	300
Products	98,450 quintals 11,547 bbls. of oil
Estimated value in French livres	2,084,450

TRADE.

Imports from France, West Indies, in French livres[3]	2,176,220
Exports	1,520,825

The difference between the imports and exports, 645,395 livres—and a similar state of things existed in most years—indicates on the face of the return a large balance against the colony, but it may be accounted for in several ways. First of all, the imports probably include a large quantity of provisions, clothing, and other goods sent out by the government for the use of the garrison and officials, and which of course demanded no commercial returns. A good deal of the merchandise entered at Louisbourg was sent for sale on commission, and no returns were made available until another year. A considerable

[1] Brown ("Hist. of C. B.," p. 340) gives an estimate of the French fisheries which is obviously very much exaggerated. The whole catch before 1758 is given at nearly a million of quintals and the number of decked vessels at 726 and of shallops at 1,555, employing altogether fifteen thousand men. Louisbourg appears by this statement to have alone employed 600 vessels and shallops and 8,400 men. This estimate is so much beyond even the "supputation" mentioned in the text, and so entirely at variance with the several official statements given in App. XVIII to this work, and all others that I have been able to consult in the English or French archives, that it is impossible to accept it as authoritative in any particular. Brown received the statement from a well known resident of Cape Breton, but it will be seen that the original source of information is not given by him. It is just possible that it includes the French vessels that came out every spring for the fishery and returned in the autumn to France ; but even so, it is altogether improbable that in the two years before 1758—a time of war—the fishing industry should have been prosecuted with so much energy off Cape Breton. The figures we give for 1753, from French official sources, assuredly illustrate the most favourable conditions of industry and commerce from 1749 to 1758 in the island.

[2] See App. XVIII (IV.) to this work.

[3] A livre was worth about 1s. 4d. of English money, or 1fr. 66 centimes of French money, present values.

amount was also paid for in cash or by bills of exchange on France. West Indian goods were largely sold to New England vessels for specie or in exchange for a small class of schooners (goëlettes) which Cape Breton fishermen and traders found well adapted to their coasts and business. The value of these vessels in 1753 was 284,230 livres. The value of the codfish exported from the colony in 1753 appears alone in the official returns of exports, and does not represent the value of the total annual catch which, according to the figures given above, was only 90,000 livres below the value of the total importations, which, as already conjectured, included goods paid for by the government in France and representing no obligations on the part of traders. In all probability the merchants as a rule carried on a lucrative business in times of peace. It was only the fishermen who suffered and were left in a state of dependence on account of the high prices they had to pay for their outfit and provisions.

The people of Louisbourg largely depended on the French Acadian settlements at Bay Verte, and on the island of St. John eventually, for supplies of meat and vegetables. Only at Port Toulouse, Mira and a few other places was there ever any attempt at cultivation of the soil.[1] Some years, however, before Cape Breton passed into the possession of England by the treaty of 1762, the French were beginning to learn that the island was not the bleak, inhospitable tract it was at first believed to be, but had fine agricultural capabilities. The farms and gardens, however, were very few in number during the French rule, and the principal occupation of the people was the fishery of cod. Around Louisbourg the soil and climate forbid any extensive cultivation, and even now the grass only grows in luxuriance above the ruins of the old town. Many of the fishermen, from all accounts, seem to have eked but a poor livelihood from the fisheries themselves. It was then, as in later times of the history of the Cape Breton fisheries, a battle for existence between the fisherman and the trader who supplied him in advance with the means of carrying on his industry. The prices charged for supplies to this class of toilers were always enormous, and as a consequence they were never out of debt. Very many of these fishermen were brought out from France, on certain conditions, for a fixed number of years, and were on that account called "engagés." It was found necessary for the government to encourage the employment of these men, as the French were very reluctant to leave their old homes in France, and seek a livelihood in the island. The fishermen of Bretagne and Normandie have for centuries risked their lives on the coasts of Cape Breton and Newfoundland, but they have always returned to France in the fall when their work is completed. The French system of colonization was never calculated to build up a great colony in the days when Canada and Cape Breton were French dependencies.[2] But under no circumstances was there ever the same readiness on the

[1] See Brown, "Hist. of C. B.," 222.

[2] "The first thing which strikes one on reading the correspondence of the governors and officials at Ile Royale is the neglect invariably manifested by France towards the new colony, from its foundation in 1713 down to the fall of Louisbourg in 1758. Then the indolence of the settlers is another point which soon becomes evident. In place of seeking their support from the soil, we find the people trying to live almost wholly by fishing, while the upper class strove to live at the king's expense. Fishing, with its prompt profits and easy returns—at that period particularly,—first attracted the attention and absorbed all the energies of the first settlers on the island; for we find M. de St. Ovide de Brouillan, the governor, complaining to the minister as early as 1717 that the inhabitants paid but little attention to the cultivation of the soil. This improvidence increased with the lapse of time, and later on we find the authorities at Louisbourg making constant appeals to the court of France and to the intendants of Canada for help and grain at times when the latter colony was itself in the throes of famine, resulting from successive bad harvests." M. Marmette in "Can. Archives," 1888, cxxxvii.

part of the French peasantry and middle class, as there was among the English, to seek their fortunes in the new world. The greatest inducements that the French government could offer to immigration to their colonies had placed only some eighty thousand people in the valleys of the St. Lawrence and Louisiana when they passed from the possession of France in 1760, against nearly a million and a quarter in the English settlements on the Atlantic coast, which had been left to fight their own way, under the influence of that indomitable spirit of colonization which has always distinguished the English race since the commencement of the seventeenth century, when they first entered on the conquest of the continent of America.

The Indians of Cape Breton belonged to the tribe of Micmacs or Souriquois, who are members of the great Algonquin family, whose representatives were found scattered over half a continent, even at the foot-hills of the Rocky Mountains. The Micmacs frequented the eastern portions of New Brunswick, Nova Scotia and Cape Breton, and their number probably ranged from three to four thousand while the French occupied those countries. They became converts to the Church of Rome, through the instrumentality of the Recollets, and were always afterwards firm allies of France from the beginning to the end of the conflict with England. It does not appear that they ever lived in any number on the southeastern part of the island during the French occupation, but only made their appearance at Louisbourg at certain seasons for the purpose of trading or communicating with the French governor. Their favourite resorts were the islands and shores of the Bras d'Or lake, and they were accustomed to go to Port Toulouse to sell their furs and obtain supplies of provisions and ammunition. They are generally described by the old historians of New England as having been more cruel and vindictive than the majority of the Canadian Indians, but in all probability they were no worse in any respect than the other savage tribes who were constantly making raids on the English settlements. They had a deep affection for the French, who took every pains to cultivate their alliance, and never treated them as a subject people. The Roman Catholic Church had always the same remarkable influence over them that it has exercised over all the Indians with whom its zealous, self-sacrificing missionaries have come into contact in America. Living with them from year to year, ministering to their spiritual and physical wants, acting as their friends and advisers in all their affairs, suffering the same privations that they did in times of destitution and war, making their very superstitions subservient to the purposes of religion, the Roman Catholic missionaries were able to exercise a power and influence among the Indians that a Protestant priest has never possessed. No doubt some of their priests, like Le Loutre in Acadie, and Rasle on the Kennebec, were the persistent enemies of the English settlements, and always led the Indians to believe that the French would eventually triumph in America.

IV. Origin and History of the New England Expedition against Louisbourg in 1745.

During the thirty years that elapsed between the treaty of Utrecht and the breaking out of war again between France and Great Britain, the people of New England found that the merely nominal possession of Acadie by the English was of little security to them, while the French still held the island of Cape Breton and had the fealty of the

Indians and Acadians who were always looking forward to the restoration of the country to its former owners. It was with feelings of apprehension that the English colonists saw a walled town slowly rising on the southeastern coast of Cape Breton. The accounts that were brought to them from time to time by New England vessels of the formidable proportions of a fortress to which there was no parallel in America—not even in Quebec from a purely engineering point of view—showed them that they had after all achieved but little when they had captured the relatively insignificant post of Port Royal. As long as the French had control of Cape Breton and were able to maintain its fortress, there was no dependence to be placed on the Acadian French, who, very reluctantly, after the cession of Acadie, had been persuaded to take an oath of allegiance to the English sovereign, and then there is no doubt with a reservation in some cases that they should not be called upon to bear arms in the case of war against their old compatriots. The Acadians, it was evident, would be restless as long as the French flag floated above the citadel in the king's bastion of Louisbourg. From 1720 to 1745 the Abenakis of the east, instigated by French emissaries, tomahawked the helpless English colonists that had made their homes in the present state of Maine, in the vicinity of the Kennebec and the Penobscot. From Annapolis to Canseau the Micmacs destroyed life and property, and kept the English posts in constant fear. The French governor at Louisbourg endeavoured to divert from himself the blame for the acts of his Indian allies; but the evidence is clear that the Micmacs believed that they were doing their French friends good service, and assisting to restore to them their old rights in Acadie. New England took a signal revenge at last on the cruel and treacherous Abenakis, and inflicted on them a blow from which they never recovered. With them perished the dauntless and unselfish Rasle, who for his fidelity to his religion and his country is a hero to the Frenchman, and for his supposed hatred of the English and the protestantism of the colonists is the object of the contumely of the English historian of those days of trial. A peace was then made between the colonists and the Indians, but New England felt she had no efficient security for its continuance while Acadian and Indian could look to the great fortress of the Cape Breton coast as the representative of France on this continent, and as powerful evidence that she was not yet willing to give up the contest for dominion in America.

We have now come to a period in the history of America and Europe when events were shaping themselves for the humiliation of France and the triumph of England. Despite the strong resistance of Walpole, the great peace minister, England had gone to war with Spain in 1739 in response to the clamour of the commercial and middle classes who were bent on breaking down entirely the trade monopoly, so long enjoyed by the Spaniards in America. The treaty of Utrecht had given England a share in the infamous slave trade, and was the first blow against the mercantile monopoly of Spain. It was now determined to destroy her power on the Spanish Main and open her ports to the commercial enterprise of Englishmen. France looked with dissatisfaction at this effort of England to extend her trade and influence in America. Even the great minister Fleury, despite his desire to maintain peace, was forced by public opinion to prevent England from appropriating to itself the entire commerce of the West Indies. "France," he said, "though it has no treaty with Spain, cannot consent that the Spanish colonies should fall into English hands."[1] Statesmen looking at the state of Europe at this critical juncture

[1] Bancroft, "Hist of the U. S.," ii. 300.

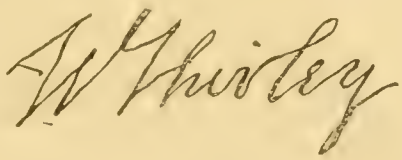
saw that the great nations were on the eve of a general war. The question of the Austrian succession had been a menace to Europe for years, and it was at last to culminate in a conflict which, despite the short truce of Aix-la-Chapelle in 1748, never ended until the treaty of Paris in 1763. France had been pledged to the Pragmatic Sanction by which Charles VI, Emperor of Germany, provided that his hereditary dominions should pass to his daughter Maria Theresa. When the Emperor died, France believed that the opportunity had come for breaking up the dominions of her great rival and increasing her own power on the continent of Europe. We can sympathize with the ambitions and necessities of the Austrian queen fighting for her kingdom and her child, but we look in vain for generous or honourable motives among those who were either her allies or her foes in the progress of that memorable war. France coveted the Netherlands, and Spain, Milan; Frederick of Prussia had no higher desire than to grasp Silesia and to drive Austria from Germany. The king of England was jealous of Prussia and thought more of his Hanoverian throne than of his English crown. It became the interest of England to assist Austria and prevent the success of France, now the ally of Spain, forced to defend her colonial possessions in America. It is wearisome to follow the intrigues and complications that the history of these times presents, and their only interest for us is the effect which the war that broke out between England and France in 1744 had on the destinies of their respective colonies on this continent. From 1740 to 1744 England had no reason to congratulate herself on the results of the war either in Europe or America. Her fleet met only with disaster, and her commerce was destroyed on the Spanish Main. Four years later she won a victory over the Spanish fleet in the Mediterranean, but hardly had her people ceased celebrating the event than they heard that the combined forces of Hanover, Holland and England under the Duke of Cumberland had been badly beaten at Fontenoy.

Those were days of gloom in England as her statesmen and people surveyed the situation on Europe, and saw their interests sacrificed by the stubborn ambition of the king and the incompetency of his ministers. At last when the prospect was darkest, there appeared a glimmer of light above the western horizon across the seas. "We are now making bonfires for Cape Breton and thundering over Genoa," wrote Horace Walpole, "while our army is running away in Flanders."[1] For the strongest fortress in French America, Englishmen heard with amazement, had surrendered to the attack of four thousand colonial fishermen, farmers and merchants, called suddenly from their industrial occupations, to achieve one of the most audacious acts in colonial history—certainly the most memorable in the records of the colonies until the war of independence thirty years later.

In recording the history of this famous episode of colonial times, writers have sometimes hesitated to say to whom should be attributed the honour of suggesting a project which, when first seriously mentioned, seemed to be too bold to be realized by men who were ignorant of those scientific rules which were absolutely essential to a siege of fortifications illustrating the genius of the best engineering skill of those times. It is admitted on all sides that one of the first persons to advocate the scheme was William Vaughan of New Hampshire, who is described by one writer as "a whimsical, wild projector," words which have been before applied to the originators of projects which have

[1] "Letters to Horace Mann," July 26, 1745.

eventually achieved a success never anticipated when first mooted. It is also certain that Lieutenant-Governor Clarke of New York, as early as 1741, in a communication to the Duke of Newcastle, dwelt on the advisability of taking Cape Breton, and of maintaining there and at Plaisance in Newfoundland, a sufficient number of ships and troops to guard the fisheries and to cut off the communications between Canada and the Mississippi, so that eventually that country would become an easy conquest.[1] In all probability the necessity of capturing Louisbourg was a subject of frequent discussion in those days when the English colonists surveyed the situation in America, and its importance in the scheme of French domination, but no one in authority seems to have moved in the matter until Governor Shirley of Massachusetts, a man of great sagacity and energy—one of the ablest statesmen of early colonial times—placed it in a practical shape before the people and the legislatures of the colonies. One thing is quite certain that the success of the enterprise from its beginning to its end must be attributed to the energy and daring of the colonists, and no English statesman ever ventured to suggest it.



If ever there was an instance of the truth of the old adage that "fortune favours the brave," it was the case of the New England expedition against Louisbourg. From the moment of the declaration of war until the capture of the town there was a succession, and, in fact, a combination of events which aided the success of the project. Although war was declared in the March of 1744, the news reached Louisbourg at least two months before it was known in Boston, and the result was that the French governor, Duquesnel, contrary to the orders of the government of France, immediately sent out an expedition in the expectation of surprising the English ports in Nova Scotia, and bringing the country under the control of France before the English could take adequate measures for its defence. At that time there were only some seventy or eighty soldiers altogether at the little port of Canseau, which was soon forced to surrender. The garrison and the few inhabitants in the place were at once taken to Louisbourg on the understanding that they would be allowed to return to England or to an English colony within a year. It was the intention of the French then to attack Port Royal, where there was at the time only an insignificant garrison in the old fort, of which the ramparts and works generally were in a wretched state. A body of some three hundred Micmac and Malecite Indians, led by two or three Frenchmen, among whom was the bold and unscrupulous priest, Le Loutre, one of the most inveterate enemies of the English in America, made their appearance before the fort on the first of July, but happily, Colonel Mascarene, the governor of Nova Scotia, then in command at Port Royal, was a man of great spirit and determination, and he succeeded in repulsing the savages who, like all Indians, never showed any disposition to attack the most ordinary fort defended by cannon. Happily for the English, the fort was well mounted with guns and when at last reinforcements, for which Mascarene had managed to send to Boston, made their appearance, the Indians retired; and on the later arrival of the French under Duvivier, who had previously taken Canseau, Governor Mascarene was able to resist attack, and his men felt additional confidence from their

[1] "N. Y. Col. Doc.," vi. 184. (See App. X to this work.)

previous success in beating off the Indians. Duvivier was a descendant of the La Tours[1] who had been, in the previous century, seigneurs of Acadie under the French *régime*, and he confidently expected, on coming into Nova Scotia, he would find the Acadians at Chignecto and Mines, where he lingered for some days before going on to Port Royal, quite ready to supply him with men and provisions, but to his dismay the people received him most coldly, and refused his overtures that they should join his expedition. His peremptory and threatening manner, when he found the Acadians unwilling to aid him, only helped to make his visit a thorough failure, and he was forced at last to proceed to Port Royal with only half a dozen men or so, whom he had persuaded, or forced at Chignecto to join his force. Duvivier found Mascarene more than his match, and he was obliged to return to Louisbourg where he was received with cold looks and sneers for his mismanagement of the expedition. On his return to France he was censured, not only for breaking the king's orders at the outset, but above all for his tardiness in moving against Annapolis directly after the capture of Canseau when there was a prospect of surprising the garrison. Had he succeeded in taking that place, his disobedience of orders would probably have been soon forgotten, and he would have received praise instead of censure. Nothing wins like success.

But all these events had their direct influence on the expedition which New England sent in the spring of 1745 against Louisbourg. The prisoners who had been captured at Canseau had remained until the autumn in Louisbourg, and the accounts they brought back of its condition gave Shirley and others reason to believe that if an expedition was, without loss of time, sent against it, there would be a fair chance of success. Not only did they learn that the garrison was small but that it was discontented and a mutiny had actually broken out on account of the soldiers not having received certain additions to their regular pay for work on the fortifications, in accordance with the usage adopted since the occupation of the fortress.[2] The ramparts were stated to be defective in more than one place, gales and other causes had delayed the arrival of the ships which arrived every year with provisions and reinforcements. The ill success of Duvivier in his attack on Annapolis, and the avowed reluctance of the Acadians generally at the time to assist their countrymen in Cape Breton, were facts which gave additional confidence to Shirley, Vaughan and many influential men who had already conceived the idea of striking a blow at the French which would give the English control of the whole coast from Cape Sable to the entrance of the St. Lawrence.

When Shirley first laid his scheme before the general court of Massachusetts in secret session it was rejected as foolish and chimerical in the extreme ; but no wise disconcerted by this failure the politic governor immediately obtained a petition largely signed by New England merchants complaining of the injuries that they had received from French privateers which found a refuge at Louisbourg. This petition induced the general court to reconsider the subject with the result that the project was carried by one vote. Previously to this, however, Shirley had sent a communication to England asking for

[1] M. Duvivivier was son of Francois du Pont Duvivier, a French officier at Port Royal, who was married there on the 12th of January, 1705, to Marie, daughter of Jacques Mius, seigneur de Ponbomcoup, et Anne St. Estienne de la Tour, who was a daughter of Charles de la Tour. He was at that time capitaine aide-major of Isle Royal. He was consequently grandson of the original La Tour, and had many relatives in Acadie. See a mémoire on Acadie, 1609-1735, believed to have been drawn up by M. Duvivier, in 1731—Murdoch's "Hist. of N. S.'' i. 508-510.

[2] The leaders of the mutineers were severely punished on their return to France. See App. IX to this work.

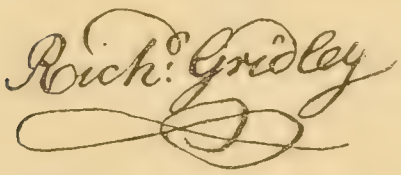
protection for the fisheries of Acadie and New England, but he had not given any definite information with respect to the plan that was then forming itself in his mind. Without waiting for an answer from England he sent circular letters to all the colonies as far south as Pennsylvania, setting forth the nature of the project and the prospects of its success. Everywhere except in New England it was regarded as a wild Quixotic scheme. Franklin looked upon it as quite impracticable. The issue was that Shirley found himself obliged to depend entirely upon the colonies of Connecticut, Rhode Island, New Hampshire and Massachusetts It was on the latter that the great burden of the expedition fell. It was exclusively a New England affair, and none of the other colonies can claim even a reflected glory from its success. Pennsylvania and New Jersey are said to have promised to send some provisions and clothing.[1] New York did a little better, for although Governor Clinton could not get any assistance in men from the legislature with which he had some differences at that time on a question of salary, he succeeded in obtaining a loan of ten pieces of small ordnance with carriages, and a quantity of powder and provisions, for which he does not appear to have been ever adequately repaid by the colony. Governor Clinton was evidently determined that his efforts to assist the expedition should not be lost sight of, for in his letter to the Duke of Newcastle he called attention to the fact that without these guns "they could not have undertaken the affair," and he had the pleasure of telling the minister "that these very cannon greatly contributed to the reduction of Louisbourg, for which he received the thanks of the general court of Massachusetts Bay in a public manner, though he could hardly get any one to pay for the transportation of them."[2] Some allowance must, however, be made for the strained relations between the governor and the legislature, and besides it is not surprising that the members of the latter should hesitate to incur very heavy expense in a matter in which none of them had any confidence. When even the general court of Massachusetts agreed to the scheme by only a majority of one, it was hardly to be expected that the legislatures of other colonies, where the plan did not originate, could be animated by enthusiasm in favour of an undertaking which appeared so likely to end in disaster.

The expedition was ready to sail on the 23rd of March, and consisted of 4,070 men, of whom Massachusetts contributed 3,250, New Hampshire 304, Connecticut 516. Maine, not then separated from Massachusetts, contributed nearly one-third of the whole force on account of the great popularity of Colonel Pepperrell of Kittery on the Piscataqua, in the villages and towns of the districts where he lived. Rhode Island had promised a force of 150 men, but unfortunately for her share in the glory of the expedition it did not arrive until the battle was won. Pepperrell had command, with the title of lieutenant-general, and it would have been impossible to have made a more judicious selection in the colonies. He had become wealthy in commerce, and held some of the most important positions in New England. He had pleasant manners and thoroughly understood the independent character of the people and the best way of managing them. He had no military experience, but he was a man of excellent judgment and undoubted courage, and

[1] See Usher Parsons, "Life of Pepperrell," p. 57; Hildreth, "Hist. of the U.S.," ii. 395. It would appear, however, from the statement of Hutchinson ("History of Massachusetts Bay," ii. 380, *n*) that these colonies contributed money and provisions only after the reduction of the fortress. Belknap ("History of New Hampshire," ii. 212, *n*) makes a similar assertion.

[2] See "New York Colonial Documents," vi. 280, 284, 285.

those were the qualities not the least necessary in the conduct of an expedition which was in every respect a bold venture not governed by the ordinary rules of military projects. The majority of his officers and men were accustomed to brave hardships on sea and land, and were composed of the same materials that afterwards at Bunker Hill, Saratoga, and on many a hard fought field of the revolution showed regular troops that there were other qualities necessary to win battles in America than those possessed by the mere machine soldier. Many of them, it must be remembered, were accustomed to the use of the gun, and were excellent marksmen. A new England writer[1] tells us that the militia of New Hampshire, as far back as 1725, "was completely trained for active service; every man of forty years of age having seen more than twenty years of war. They had been used to handle their arms from the age of childhood, and most of them, by long practice, had become excellent marksmen and good hunters. They were acquainted with the lurking places of the enemy, and possessed a degree of hardiness and intrepidity which can be acquired only by the habitude of those scenes of change and fatigue to which they were daily exposed." But in 1745 the New England colonies had been at peace for many years, and the majority of those who took part in the expedition had never seen actual service. All of them certainly were ignorant of the simplest methods of siege operations, or of the use of heavy ordnance. The expedition was not only very defective in necessary materials of war for such important operations, but was without a sufficiency of military stores. They had only some pieces of ordnance which they obtained from New York and Castle Island with great difficulty. The next in command to Pepperrell was General Wolcott from Connecticut, who had served with Nicholson as far back as 1711, when the invasion of Canada was contemplated, and although well advanced in years was full of life and energy. Samuel Waldo, of Boston, who had experience in the militia and was also a member of the general council of Massachusetts, was named brigadier-general. He was at first chosen as second in command, but the position was afterwards given to Wolcott, then deputy-governor of Connecticut, on the express condition made by that state in furnishing its contingent. Captain Edward Tyng, a capable New England seaman who had captured a French privateer of large size a short time before, was chosen as commodore of the little fleet of thirteen vessels, carrying in all two hundred guns. One of the most useful officers was Richard Gridley, on account of the aptitude he afterwards displayed for artillery service during the siege.



[1] Belknap, "Hist. of New Hampshire," ii. 82, 83.

[2] The officers in Pepperrell's army are given by Parsons, "Life of Pepperrell" (App. B.), as follows:

1. York County, Pepperrell's Regiment.—Colonel Bradstreet, Lieutenant-Colonel Storer, Major Cutts. Captains Peter Staples, Ephraim Baker, John Fairfield, Bray Dearing, John Kinslagh, John Harmon, Moses Butler, Thomas Perkins, William Warner, Moses Pearson.

2. Connecticut, General Wolcott's Regiment.—Colonel Burr, Lieutenant-Colonel Lothrop, Major Goodridge. Captains David Wooster, Stephen Lee, Daniel Chapman, William Whiting, Robert Dennison, Andrew Ward, James Church, Henry King.

3. Cumberland County, Colonel Waldo's Regiment.—Lieutenant-Colonel Noble, Major Hunt. Captains Samuel Moody, John Watts, Philip Damarisque, Benjamin Goldthwait, Daniel Hale, Jacob Stevens, James Noble, Richard Jaques, Daniel Fogg, Joseph Richardson.

The preparations for the sailing of the expedition resembled a crusade against the hated French. The conditions of the times were in many respects favourable for enlisting men. Not only were the commercial interests of New England deeply at stake in the reduction of the French fort, and in obtaining possession of an island which controlled the Gulf of St. Lawrence, but the religious instincts of the people had been not very long before stirred up by what has ever since been known in colonial history as the "great awakening," which, like revivals in later years, rushed like a powerful wave of religious sentiment, and even of fanaticism, among the masses of the people. Deep in the hearts of the descendants of the Puritan settlers of New England, was a hatred of Rome and its adherents, and when the call was made against Louisbourg, no doubt it was better obeyed than if there had been no stimulus given to the protestantism of the people by the "great awakening," to which Whitfield, at the time in the country, lent the power of his eloquence.[1]

The old Puritan spirit of the colonies asserted itself at this crisis, and supplications went up to Heaven on all sides in the churches and the homes of the people for the success of an expedition which was to crush Romanism and its superstitions. The troops were volunteers "in the service of the great Captain of our Salvation." The eminent preacher, Whitfield, who was still in America, had not given Pepperrell much encourage-

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4. Brigadier Dwight's Regiment.—Colonel of Artillery, Lieutenant-Colonel Thomas, Major Gardner.

5. York County, Colonel Moulton's Regiment.—Lieutenant-Colonel Donnell, Major Ellis. Captains John Card, John Lane, Christopher Marshall, James Grant, Charles King, Peter Prescott, Ami R. Cutter, Samuel Rhodes, Bartholomew Trow, Estes Hatch.

6. Worcester, Colonel Willard's Regiment.—Lieutenant-Colonel Chandler, Major Pomroy. Captains Joshua Pierce, John Terry, John Alexander, David Melvin, John Warner, Jabez Homestead, Joseph Miller, James Goulding, James Stephens.

7. Essex, Colonel Hale's Regiment.—Lieutenant-Colonel Eveleigh, Major Titcomb. Captains Benjamin Ives, Daniel Eveleigh, ——— Titcomb, John Dodge, Jonathan Bagley, Jere Foster, Samuel Davis, Thomas Stanford, Charles Byles.

8. Bristol, Colonel Richmond's Regiment.—Lieutenant-Colonel Pitts, Major Hodges. Captains Nathaniel Bosworth, Thomas Gilbert, Josiah Pratt, Robert Swan, Ebenezer Eastman, Cornelius Sole, John Lawrence, Nathaniel Williams, Ebenezer Nichols, ——— Weston.

9. Colonel Gorham's Regiment.—Lieutenant-Colonel Gorham, Major Thatcher. Captains Jonathan Carey, Elisha Doane, Sylvester Cobb, Israel Bailey, Edward Demmick, Gershom Bradford, Samuel Lombard.

10. New Hampshire, Colonel Moore's Regiment.—Lieutenant-Colonel Meserve, Major Gilman. Captains Samuel Whitten, William Waldron, True Dudley, Tufton Mason, William Seaward, Daniel Ladd, Henry Sherburne, John Turnel, Samuel Hale, Jacob Tilton, Edward Williams.

The colonial fleet was composed as follows: Massachusetts frigate, 24 guns, Captain E. Tyng commodore; Shirley galley or snow, a two-masted vessel, 24 guns, Captain J. Rous; Cæsar, 20 guns, Captain Snelling. In addition there were the following: One snow and three sloops, 16 guns each; one sloop, 12 guns; one, 14 carriage guns and 12 swivels; one, 14 guns; two, 8 guns each; a privateer of 20 guns hired from Rhode Island. Massachusetts provided nine of these armed vessels at her own expense, besides one hundred transports. Parkman gives the Massachusetts and Shirley only 20 guns, but the actual force appears to have been 24. See Drake, "Five Years' War," 246; "Nar. and Crit. Hist. of Am.," v. 437, *n.*; Parkman, 'Atlantic Monthly' for March, 1891, p. 322. Barry, "Hist. of Massachusetts," ii. 141. The whole number of guns was 204, according to Parsons, "Life of Pepperrell," 50.

[1] "This religious revival began to make itself felt in 1734, under an impulse from Jonathan Edwards, and later, under the ministrations of George Whitfield, the wild passion—for it became scarce else—spread through the churches and communities of New England." "Nar and Crit. Hist. of Am." v. 133-135. "The expedition," says Parkman, ('Atlantic Monthly' for March, 1891, p. 321) "had, in fact, something of the character of a crusade emphasised by the lingering excitation of the 'great awakening.'"

ment when he was asked for his advice, but later on he suggested the motto for the flag:

"*Nil Desperandum Christo Duce.*" [1]

A clergyman who accompanied the troops is said to have carried a hatchet for the express purpose of destroying the images in the French churches.[2] This was one of the inspiring motives of a large number of his companions, who, whilst they looked, like the Ironsides of Cromwell, to Providence for special assistance did not neglect to look after their powder and to take other worldly precautions necessary even in the case of those who believed that their tenets of faith and mode of worship particularly commended themselves to heaven compared with the dogmas and superstitions of Rome. One devout colonial soldier,[3] at the commencement of the siege, informed the general in command that he had achieved a notable success—the occupation of the royal battery—"by the grace of God and the courage of thirteen men."

V. The Siege and Taking of Louisbourg in 1745.

Whether the designs of religious enthusiasts to destroy the symbols of religion in the Roman Catholic churches recommended themselves or not to a beneficent Providence, it is quite sufficient to know that the stars in their courses fought against the French Sisera. From the starting of the expedition until it appeared before Louisbourg the French acted as if they had no warning whatever of the attack that was to be made upon them. When the fleet of one hundred vessels arrived at Canseau in the early part of April the colonial leader found that the whole eastern coast of Cape Breton was blocked with ice, and that it was impossible to enter any of its ports and bays. While the harbours to the north of Scatari Island, which lies to the northeast of Louisbourg, may be full of drift ice, that place as a rule is generally clear, but in 1745 there appears to have been unusual quantities on that coast to stop all communications with the port. The colonists had already detailed several armed vessels to cruise off Louisbourg and prevent any news of the proposed expedition reaching the French garrison. One French frigate, the Renommée, fell in with the fleet off Canseau, but succeeded in escaping to France. While at Canseau Pepperrell built a block-house in which he stationed a small force and a few cannon. The French post at Port Toulouse was destroyed by his orders, and some vessels were sent to Bay Verte to prevent provisions and men being sent to the fortress. On the 22nd of April, a week before the expedition left Canseau, the English frigate Eltham arrived with the welcome news that Commodore Warren was on his way. On the following day he made his appearance with three ships to the great joy of the colonial troops. While

[1] "Whitfield, with a good deal of worldly wisdom, cautioned Pepperrell that if he failed the blood of the slain would be laid to his charge, and that if he succeeded the envy of the living would pursue him." T. H. Higginson in "Memorial History of Boston," ii. 115, *n.* See account of interview between Pepperrell and Whitfield in "Tyerman's Life of Whitfield," ii. 150.

[2] This was the Rev. Samuel Moody, minister of York, senior chaplain of the expedition. (See *infra*, p. 222.) He had not a few sympathizers, like John Gray of Biddeford, who wrote to Pepperrell: "Oh that I could be with you and dear Parson Moody in that church [Louisbourg] to destroy the images there set up, and hear the true gospel of our Lord and Saviour there preached!" See Parkman, "Capture of Louisbourg by the New England Militia," 'Atlantic Monthly,' March, 1891.

[3] This was William Vaughan, one of the projectors of the expedition. See *infra*, third page.

at Antigua he had refused to give any aid to Shirley without orders from England, and it was with some dismay that the colonial commanders heard the news on the eve of the sailing. They had determined to keep it secret from their troops until they had reached Louisbourg. Happily, however, the expedition was not put to this trying test, for it appears that as soon as the Duke of Newcastle had received Governor Shirley's letter informing him of the necessity for protecting the English fisheries, he sent orders to Commodore Warren to sail at once for Boston and arrange measures "for the annoyance of the enemy and his Majesty's service in North America." While Warren was on his way to the colonial town he intercepted a Boston schooner and heard the news of the departure of the expedition. Thereupon he changed his course for Canseau.

It was the intention of Shirley that the expedition should arrive off Louisbourg at night, that the troops should land, march silently over the rocky, mossy ground, creep in some mysterious way up walls at least thirty-six feet high, and then surprise the sleeping and unsuspicious garrison. All the elements were to combine to ensure the success of this absurd project, which was conceived in the same imaginative vein that originated the genii of the Arabian tales. The surf was to cease to roll on the beach of Gabarus Bay, and the darkness of the night was to be the means of enabling the troops to perform a marvellous march over an unknown and dangerous tract of country. Shirley, however, was not alone in suggesting wondrous agencies for the surprise of the town. One ingenious person proposed a flying machine that would enable the troops to scale the walls before a bridge was made. Vaughan had proposed an equally easy plan of marching on snowshoes over the drifts that in the winter were frequently, according to him, level with the ramparts of the fortress. These very schemes of the fertile New England intellect were so many evidences of the prevailing opinion that the enterprise was very hazardous and not likely to be accomplished by the ordinary means at the command of the expedition As it happened, however, the garrison at Louisbourg was to a great extent practically taken by surprise. One of the inhabitants[1] of Louisbourg has given us the testimony that the authorities, "though informed of the preparations [in New England] from the first, lost precious moments in useless deliberation." It appears, however, that "nothing to the purpose was done, so that we were as much taken by surprise as if the enemy had pounced upon us unawares." Governor Duchambon,[2] by some strange fatuity, had not taken the most ordinary precautions to keep himself thoroughly informed of every movement on the coast which might indicate the approach of an enemy. In his

[1] "Lettre d'un Habitant de Louisbourg," etc., cited by Parkman, 'Atlantic Monthly' for March, 1891. See App. X to this work.

[2] M. Duchambon appears to have been king's lieutenant ("Can. Archives," 1887, cccxiiii), and took command of the fortress on the death of M. Duquesnel in the autumn of 1744, but it is not certain that he had received his commission as governor when the siege of 1745 ended in the loss of Cape Breton to the French. His son, Duchambon de Vergor commanded at Fort Beauséjour in 1755, when taken by the English. M. Marmette comments in this sarcastic vein on the application made in 1761 by the latter for the cross of St. Louis ("Can. Archives," 1887, cclix) as a reward for his services: "Doubtless because he was to surrender on the 16th June the fort of Beauséjour, almost without striking a blow, after a mere shadow of a siege, which evil-minded people designated by the humorous appellation of 'siège de velours.' And, again, this is the person who, when commanding the fort at the Coves, allowed himself to be captured in his bed, and gave so easy an entrance to the English troops to the Plains of Abraham on the 13th September, 1759. It was not the cross, but rather the hangman's rope which these two scandalous affairs ought to have gained for him." Both son and father are clearly for sufficient reasons not popular in France or French Canada.

communication to the French minister, written after the fall of Louisbourg, he attempted to show that he had made a feeble effort to obtain news from Port Toulouse of the presence of an enemy in that direction; but although he had some information that there were strange sail on that coast and vessels had been even seen hovering off the port of Louisbourg itself for weeks, while the ice was blocking the eastern shores of the island, he appears to have lulled himself to sleep and to have awakened to a full consciousness of his danger only three days, according to his own account, before the fleet arrived in force on the morning of the 30th of April[1] in the roadstead of Gabarus Bay. His blindness for weeks before the attack actually took place was characteristic of a man who had persisted in refusing assistance from Quebec, when it had been offered to him by the governor of Canada in the autumn of 1744. One colonial historian asserts that there was a ball in Louisbourg the night before the fleet arrived in Gabarus, and we could well believe this to be a fact when we consider the many evidences before us of the indifference or ignorance of danger shown by the governor until the English were on the very point of landing, Then, with the fleet in view of the ramparts, bells were rung and cannon fired to give the alarm to the people of the adjacent settlements, and to bring them into the town. Dull Duchambon at last recognized his peril. He made a feeble attempt to resist the landing of the colonial forces by sending a detachment of 150 men, under the command of Monsieur Morpain and Sieur Mesilac—the former a famous "corsair,"—but it was unable to accomplish anything, through a ruse on the part of the officers in charge of the English boats. While the French were preparing to prevent a landing in the vicinity of Flat Point, the English quickly retreated and made for the shingle beach of the little cove some distance higher up the bay, known to the French as Anse de la Cormorandière, and to the English as Freshwater or Kennington Cove. Here, before the French detachment could reach the ground, the English colonists succeeded in effecting a landing under the fire of their ships' cannon. The French were forced to retreat precipitately to the town, after a short engagement, in which they lost several men, killed or taken prisoners. Among the latter was Monsieur de la Boularderie, one of the inhabitants of the island.[2] One writer places the French commander among the number, but Monsieur Duchambon does not give his name, and it appears to be incorrect.

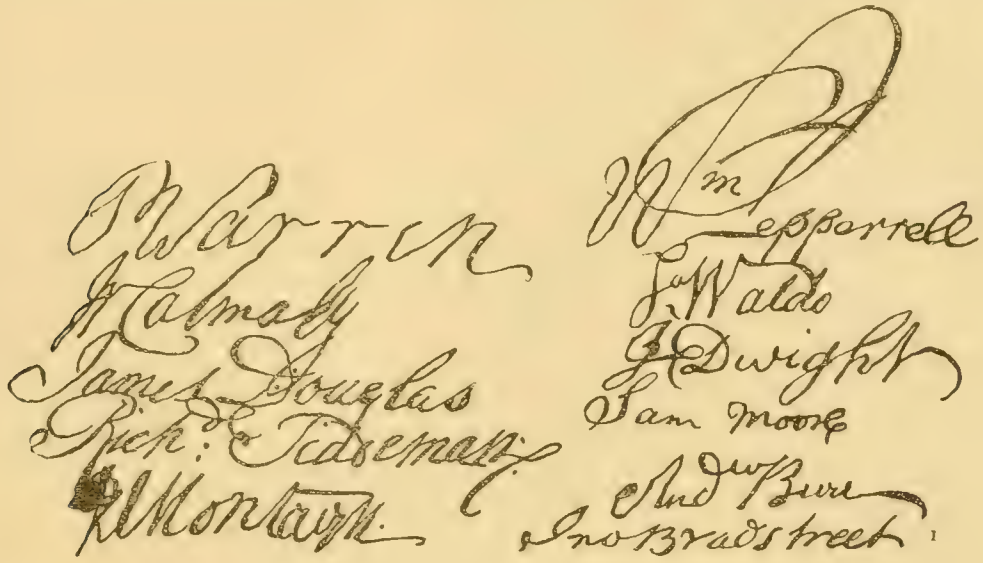
When we review the history of this memorable epoch in the history of America we find that fortune, favourable so far, continued to smile on the expedition until it achieved its object. The whole force of four thousand men were landed without difficulty by the 1st of May. If Pepperrell and his officers were not skilled in the scientific methods of investing a fortified town, at all events they acted with judgment in the steps they took for its reduction. They made their headquarters by the side of a little stream of fresh water which descends near Flat Point, or Artillery Cove, about two miles from White Point.[3] In front of their lines rose the formidable walls and bastions constructed on the

[1] In the printed accounts of the operations there is great confusion as to dates. Most, although not all, of this confusion will disappear if it be borne in mind that in 1752 the new style of reckoning time was adopted, but that its use crept in gradually, some retaining the old, others using the new, between which there was a difference of eleven days. Consequently the two dates of landing [at Gabarus Bay], 30th of April and 11th of May, agree when we take the difference between the old and new styles into account. "Can. Archives," 1886, ix.

[2] See *infra*, sec. IX, for an account of the La Boularderie, who has given his name to a well known island at the entrance of the Bras d'Or lake.

[3] See Plate IV at end of this work giving plan of the fortifications and the siege operations of 1745.

plans of the best engineering skill of the day. It was impossible with their limited force of men and weak artillery to attack the whole range of fortifications which extended from the Dauphin or west gate to the shore, and therefore they confined their efforts to effecting a breach in the fortifications between the Dauphin's and the King's bastions. With this object in view they constructed four fascine batteries which were respectively situated at distances of 1,550, 600, 440 and 250 yards from the walls. The last, or breaching, battery was made eighteen days after the landing and did great execution on the west gate. Before this work, however, was completed another fascine battery, named Titcomb's, or the northwest battery—one of the most effective, according to Duchambon—was erected on a rising ground on the western side of the barachois at the southwestern end of the



harbour. By the construction of this battery the men busy in the breaching battery were enabled to finish their work more rapidly, since it kept up a furious fire which engaged all the attention of the men who defended the walls at the Dauphin bastion. But at the very commencement of the siege, on the second day, there occurred an event most fortunate for the besiegers. The grand or royal battery, situated on the western shore of the harbour, and a very powerful auxiliary in the defences of the town, was found suddenly deserted by the French. The English and French narratives give different reasons for this hurried evacuation of an important work. The English accounts have been to the effect that when Colonel Vaughan went on a reconnoitering expedition around the harbour, during the afternoon of the 1st of May, he set fire to the storehouses at the northeast arm, and as these contained a large quantity of pitch and other combustible goods, they made great volumes of smoke, which enveloped the surrounding country and produced so much consternation among the troops in the grand battery into which it was carried that they supposed the whole army was about to attack them, and carelessly spiking their guns they fled precipitately to the shelter of the town. When Vaughan was returning to camp the next morning from his expedition he was surprised to see that there was no flag flying over the battery, and no smoke coming from its chimneys; but

[1] This list of signatures shows the Colonial and English officers who were present at a council of war held on June 3, 1745, on board Warren's ship the Superbe. "Mem. Hist. of Boston," ii. 118.

afraid of some trick of the enemy he would not venture near until he bribed an Indian with a bottle of spirits to approach as close as possible, as if he were drunk or crazy. Finding everything perfectly still the Indian climbed into an embrasure and found the battery deserted. Vaughan and his men took possession, and as they had no flag with them a lad climbed the flagstaff and fastened his red coat at the top.[1] The colonists held the battery successfully until reinforcements arrived, although the French commenced at once firing on them from the batteries of the town, and a number of men in several boats attempted to land and reoccupy the works which had been deserted in so cowardly a manner. These boats, it is probable, were sent for the purpose of completing the spiking of the cannon and carrying off the stores in the battery.

This is the story that has generally found currency in English histories of the siege, but it would appear from the very candid and evidently truthful narrative of the inhabitant of Louisbourg to which I have previously referred, that the French troops in the battery were seized with fright the moment Vaughan's force made its appearance on its way to burn the storehouses, and immediately evacuated the works without waiting for the enemy to fire a shot, and show an intention to attack.[2] The French governor, on the other hand, asserts that Captain Thiery, who had charge of the battery, evacuated it in accordance with the decision of a council of war which was called to consider his statement that it could not successfully resist for any time an attack by the enemy. We are also told that Monsieur Verrier, the chief engineer, objected to the proposition to blow up the battery, and the council yielded to his advice, the force of which it is impossible to appreciate when we consider that, if left intact, it would be of some use to the besiegers. One thing is quite certain that the French left the battery in great haste, and did their work of spiking the guns so ineffectively that these were soon made available for the purposes of the siege. The history of this affair affords of itself evidence of Duchambon's carelessness and incompetence. The fact that the storehouses were left, with all their contents, to fall into the possession of the besiegers, shows that the officials had lost their heads as soon as the enemy had made their appearance in force. These storehouses should have been immediately destroyed as was done in 1758. If the battery could not be held, as Captain Thiery believed, it should have been blown up on the instant. As it was, however, the English colonists obtained easy possession of a work which was immediately used against the town, and the first step was taken towards facilitating the entrance of the fleet into the harbour, of which this battery formed one of the most important defences. By another lucky stroke of fortune, thirty cannon were subsequently found near the careening cove on the east side of the northeast arm, and were used in the execution of a project which the besiegers found was absolutely necessary to the reduction of the fortress, and that was the construction of a battery at Lighthouse Point to silence the guns on the island, which effectively prevented the English fleet from coming into the harbour, and attacking the town at close quarters. The difficulties of constructing the works of the besiegers and carrying cannon and materials over the rocky, swampy ground around Louisbourg were enormous and entailed great hardship on the

[1] William Tufts, of Medford, aged 18. Samuel Adams Drake, in his short account of the "Taking of Louisbourg," (Boston, i. 1890) falls into the error (p. 113) of making this exploit of a courageous New England lad an episode of the disastrous attempt of the party, headed by Captain Brooks some time later, to obtain possession of the island battery. See *infra*, next page.

[2] Parkman, ("Atlantic Monthly," April, p. 517) cites the words of the inhabitant of Louisbourg.

colonial forces, however inured to severe labour many of them might be. One of them successfully devised a plan of dragging the cannon by sledges over the uneven surface between Flat Point Cove and the besieging works. From the beginning to the end of the siege, however, the colonial troops showed an amount of endurance, patience and cheerfulness in carrying out the orders of their officers that no regular troops could surpass. The men engaged in rough sports even while cannon balls were whizzing around them, and one severe critic of the expedition has written that "this siege was carried on in a tumultuary manner resembling a Cambridge commencement." [1] Many of them could not be provided with comfortable tents in consequence of the dearth of suitable material in some of the colonies; [2] and were obliged to find protection in camps rudely constructed of sod and spruce boughs. They performed their duties with a recklessness and an indifference to danger which was probably in a measure the result of their inexperience in such affairs. They laughed at the scientific instructions of Bastide, an eminent engineer, who arrived, late in the siege, from Annapolis to assist in the operations against the fortress. Indeed, no regular force could hardly have performed the same labours with as much confidence and zeal as these men animated by religious as well as patriotic motives, and feeling the honour and prestige of New England so deeply involved in the success of an enterprise thoroughly colonial in its inception and execution.

By the eighteenth day of the siege the batteries began to show their work on the walls at the west gate, the principal point of attack. Then occurred another event of even greater importance than the evacuation of the grand battery, and that was the capture of the French man of war Vigilante, manned by five hundred men and armed with sixty-four guns, which had arrived off the harbour with a cargo of stores for the town, and which had taken the place of the spring ship that had been accidentally burnt in Brest harbour during the spring of this year. This success raised the hopes of the land forces, who were beginning to feel that unless the island battery was destroyed and the fleet enabled to enter the harbour to join in a combined attack on the fortress, the siege might continue indefinitely until succour could arrive from France and Louisbourg be saved from its perilous position. An attack that was made on this battery by a large force proved a disastrous failure, and sixty men were killed and one hundred and sixteen made prisoners by the French. This unfortunate expedition appears to have been undertaken chiefly to satisfy the pressing demands of Warren that no time should be lost in making a simultaneous assault by the army and fleet on the fortress, as there was every likelihood of succour reaching the French at any moment. The confident and impetuous Vaughan appears to have been among the ardent promoters of this enterprise, the practicability and wisdom of which were doubted by the majority of the colonial officers except, strange to say, by the cool and judicious Pepperrell himself. The expedition was composed mostly of volunteers from the troops and transports, and was headed by a Captain Brooks whose head, according to one account, was split in two by a cutlass as he was attempting to haul down the French flag in the battery into which it is believed he and a few other brave fellows succeeded in forcing their way.

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[1] Douglass' "Summary," i. 352.

[2] "All the ticklenburgh and small canvas in the province was purchased by the committee of war, but for a great part of the tents they were forced to buy common oznaburgs."—Belknap, "Hist. of New Hamp.," ii. 377 *n*.

It became then an absolute necessity that a battery on Lighthouse Point should be built without delay, and after herculean exertions cannon were dragged over the precipitous hills and dangerous morasses to the chosen place. A mortar was brought to supplement the ordinary artillery, and then day by day the battery and fleet kept up a heavy cannonade on the island work until its fire slackened, its walls began to fall, and it was becoming rapidly useless. By the eleventh of June the fate of the town was practically decided. The French garrison, worn out by their exertions, saw the breaches at the west gate and the adjacent defences daily widening, the guns of the circular battery almost silenced, all the buildings in the town riddled with shot and hardly fit to live in, the island battery on the point of total destruction, and the land and naval forces of the enemy making preparations for a combined attack on the fortress. It was just at this juncture that Pepperrell and Warren decided on a piece of strategy which they thought would probably be effective in disheartening the French garrison. A body of Indians having not long before barbarously tortured and killed a few of the colonial troops whom they had surprised at Petit Lorembec, it was determined to bring this fact to the knowledge of M. Duchambon by means of the late commandant of the Vigilante, whose loss, the English suspected, was still unknown to the French. This officer, the Marquis de Maisonfort, was given proof of the kindly treatment of the French prisoners on board the English vessels, and was then asked to write informing the French governor of the fact and asking similar treatment for the English prisoners. When the French commandant and his officers received this information they expressed their surprise and consternation in the presence of the bearer of the letter who they thought was ignorant of the French language. M. Duchambon in his reply disavowed all responsibility for the cruelty of the Indians whom he would do his best to warn against committing such acts in the future, while at the same time he dwelt on the fact that the English prisoners in his hands, sick or wounded, had always received as many attentions as if they were subjects of the French king. The flag of truce, however, had the effect which it was intended it should have upon the garrison and people of Louisbourg. As if their condition was not already sufficiently distressing, they heard now for the first time that the ship which they had been hoping might evade the blockading fleet and make its way into port, was actually in the possession of the enemy, and its very guns directed against the town which it was intended to assist. Without a prospect of speedy assistance from France, the situation of the French became more gloomy, while that of the besieging forces was improved by additions to the ships Warren had been reinforced by vessels from Newfoundland and England, and had now under his orders a fleet of eleven ships armed in all with five hundred guns, including the Vigilante, and exclusive of the colonial vessels.[1] It was decided to make a general assault on the fifteenth of June and accordingly all the ships were ranged in a line off the harbour, and the troops mustered in full force, when Duchambon, recognizing the uselessness of further resistance, opened negotiations with Pepperrell and Warren, and agreed

[1] Douglass, "Summary of the British Settlements" (i. 351, *n.*) enumerates the English fleet as follows: Commodore Warren's West India fleet—the Superbe of 50 guns, the Launceston of 40, and the Mermaid of 40; the Vigilante of 64, manned after the capture on May 19 by New England men mostly. May 22, the Princess Mary of 60 and the Hector of 40, from England *via* Boston. June 10, the Chester of 50, from England. June 12, the Canterbury of 60, the Sunderland of 40, and the Lark of 40, all called in from Newfoundland; the Eltham of 40, called in from convoying the New England mastships for England.

to surrender the town on the condition that the garrison were allowed to march out with all the honours of war.[1]

On the afternoon of June the 17th General Pepperrell marched at the head of his army through the west or Dauphin gate into the town, and received the keys from the commandant, who, with his garrison drawn up in line, received him in the King's bastion. Warren, after taking possession of the Island battery, which had so long proved a formidable obstruction to the entrance of the fleet, came into the harbour, and then amid a general salute from the ships and batteries the English flag was hoisted on the walls of the French fortress. As soon as the city was formally handed over to the English the French flag was kept for a few days on the citadel with the view of deceiving any French vessels that might make the port. This strategem had a remarkable success, for it

[1] The express terms of the capitulation are set forth in the following ultimatum from Pepperrell and Warren to Duchambon:

"CAMP BEFORE LOUISBOURG, 16th June, 1745.

"1st. That if your own vessels shall be found insufficient for the transportation of your persons and proposed effects to France, we will supply such a number of other vessels as may be sufficient for that purpose; also, any provisions necessary for the voyage which you cannot furnish yourselves with.

"2nd. That all the commissioned officers belonging to the garrison and the inhabitants of the town may remain in their houses, with their families, and enjoy the free exercise of their religion, and no person shall be suffered to misuse or molest any of them till such time as they can conveniently be transported to France.

"3rd. That the non-commissioned officers and soldiers shall, immediately upon the surrender of the town and fortress, be put on board his Britannic Majesty's ships, till they all be transported to France.

"4th. That all your sick and wounded shall be taken tender care of in the same manner as our own.

"5th. That the commander-in-chief, now in garrison, shall have liberty to send off covered wagons, to be inspected only by one officer of ours, that no warlike stores may be contained therein.

"6th. That if there be any persons in the town or garrison which may desire shall not be seen by us, they shall be permitted to go off masked.

"7th. The above we do consent to and promise, upon your compliance with the following conditions:

"1. That the said surrender, and due performance of every part of the aforesaid premises, be made and completed as soon as possible.

"2. That, as a security for the punctual performance of the same, the island battery, or one of the batteries of the town, shall be delivered, together with the warlike stores thereunto belonging, into the possession of his Britannic Majesty's troops before 6 o'clock this evening.

"3. That his said Britannic Majesty's ships of war now lying before the port shall be permitted to enter the harbour of Louisbourg without any molestation, as soon after six of the clock this afternoon as the commander-in-chief of said ships shall think fit.

"4. That none of the officers, soldiers nor inhabitants in Louisbourg, who are subjects of the French king, shall take up arms against his Britannic Majesty, nor any of his allies, until after the expiration of the full term of twelve months from this time.

"5. That all subjects of his Britannic Majesty, who are now prisoners with you, shall be immediately delivered up to us.

"In case of your non-compliance with these conditions, we decline any further treaty with you on the affair, and shall decide the matter by our arms, and are, etc."

Governor Duchambon accepted the terms on the conditions set forth in the following letter from General Pepperrell:

"SIR,—I have yours, by an hostage, signifying your assent to the surrender of the town and fortress of Louisbourg, and the territories adjacent, etc., on the terms this day proposed to you by Commodore Warren and myself, excepting only that you desire your troops may march out of the garrison with their arms, and colours flying, to be then delivered into our custody till the said troops' arrival in France, at which time to have them returned to them—which I consent to, and send you an hostage for the performance of what we have promised; and have sent to Commodore Warren, that, if he consents to it, he would send a detachment on shore to take possession of the island battery." On the same day Commodore Warren agreed to the same conditions, "on consideration of your gallant defence." Parsons' "Life of Pepperrell," 95-99, and the Quebec "Collection de documents relatifs à l'histoire de la Nouvelle-France," iii. 221-226, publish this correspondence in full.

led to the capture of several ships laden with valuable cargoes, valued at £175,000 sterling; but the most important prize was the frigate "Notre Dame de la Délivrance," laden with cacao under which were hidden nearly two millions of Peruvian dollars, besides a considerable amount of gold and silver in ingots and bars, probably four million dollars altogether. Among the passengers was a distinguished scientific man, Don Antonio De Ulloa, who had been associated with some members of the Royal Academy of Sciences at Paris in measuring an arc of the meridian under the equator in South America. Two other French frigates, the Marquis d'Antin and the Louis Érasmé, which were in company with the Délivrance, had been captured with their rich cargoes of gold and silver by some English privateers five degrees to the westward of the Island of Flores, and the captain of the latter vessel, which received much damage in the action, considered it most expedient to seek safety at Louisbourg, where he confidently expected to find a considerable French fleet at a time when France was at war with a maritime power. DeUlloa has left us an interesting account[1] of his voyages in South America, and of his visit to Louisbourg under circumstances disheartening to men who thought they were in safety until they found their vessel was a prize to two English men-of war, the Sunderland and Chester. DeUlloa was treated with every consideration due to so eminent a man, and all his scientific papers were carefully preserved and handed back to him on his arrival in London.

When the English colonists surveyed the state of the town they had abundant evidence of the execution that their artillery had done in every part. "All the houses," says one eye witness,[2] "one only excepted, had some shot through them more or less; some had their roofs beat down with bombs; as for the famous citadel and hospital, they were almost demolished by bombs and shot."

By the articles of capitulation the garrison and residents of Louisbourg were to be transported to France as soon as possible on condition that none of them who were subjects of the French king should take up arms against England or any of her allies for twelve months from the date of the document. Altogether six hundred and fifty veteran troops, thirteen hundred and ten militia, the crew of the Vigilante—five hundred and sixty altogether—and two thousand inhabitants, as far as can be ascertained, subsequently embarked for Rochefort. A discrepancy exists between the English and French accounts as to the number of French killed during the siege. Duchambon states it to be fifty, and adds that ninety-five were wounded and very many ill on account of the hardships they suffered. It is generally believed that the number of killed was greater, but there are no reliable data at hand. The total loss of the English, including the number of those who died from dysentery and other complaints, due to exposure and severe toil on the damp ground in the vicinity of the town, is given at one hundred and thirty men in all. Seventy-six cannon and mortars, and a considerable quantity of provisions and munitions of war fell into the hands of the English. Duchambon declares also that he had only a small quantity of powder left at the time of the capitulation, and that he had actually used sixty-seven thousand kegs, but, as an historian[3] of the siege very truly says, "this statement is incredible, for supposing that each keg contained only twenty-five pounds,

[1] See App. X to this work for a reference to his work giving his impressions of Louisbourg.

[2] Gibson, "Journal of the Siege."

[3] Brown, "Hist. of Cape Breton," p. 234.

he must in this case have expended seven hundred and fifty tons of powder in forty-eight days, or fifteen tons per day." When we carefully read the governor's report, written on the 2nd of September, it is quite evident that he endeavours to exaggerate any fact that may create the impression that he made every possible effort to prevent the town falling into the hands of the English. Whatever mistakes he made previous to the siege, it must be admitted that he fought bravely for the town afterwards, despite the difficulties that surrounded him. He was unable to obtain any assistance from other parts of the island. The settlements of Port Toulouse, Port Dauphin and Inganiche had been captured by the English, one before and the others during the progress of the siege by vessels detailed for that purpose by Commodore Warren. The governor's attempt to recall a considerable number of Canadians and Indians who had been sent under a Canadian officer, Sieur Marin, to attack Port Royal was unsuccessful. Some small bodies of French and Indians attempted to harass the colonial troops, as the siege went on, but they were easily repulsed and scattered. The soldiers and militia fought courageously, but it is said the officers had no confidence in their men since the mutiny and prevented the commandant from ordering more than one sortie, and that was practically a failure. The governor, however, does not hesitate to "render justice to all the officers of the garrison and to the soldiers and to the inhabitants who defended the place, all of whom have generally supported the labours of the siege with a courage without parallel during the one hundred and sixteen days it lasted,"—the figures here given being another evidence of his inaccuracy in all matters of statistics. The brave conduct of the garrison cannot, with all the evidence before us, be denied, and had Duchambon shown any foresight before the expedition arrived, the colonial troops would probably have found the task before them much more difficult of accomplishment.

The siege had lasted in all forty-seven days and must always be remembered as among the most glorious exploits ever achieved by a body of volunteers. When the news reached England and the colonies there were general rejoicings at so great a victory. Boston, New York and Philadelphia were illuminated, and public thanksgivings were offered in all the churches of New England for this memorable triumph of colonial troops. In the parent state it created much enthusiasm at a time when the public mind was dismayed by the news of disaster on the continent, and there was a spirit of unrest abroad throughout the British islands. Cannon thundered from the Tower and the Park, while the city was ablaze with bonfires and resounded with the huzzas of joyous processions of citizens surprised and delighted at the success of their fellow countrymen in the new world. It did not take long, however, for this victory to be forgotten; for when, a few years later, the American colonies had asserted their independence of England, and the question of the capture of Louisbourg came up incidentally in a discussion in the British Parliament, it was attempted to give all the credit to Commodore Warren and ignore the all important part performed by the colonial expedition, Some English historians in later times have not thought it worth while to mention this victory, which Smollett considered "the most important achievement of the war of 1745." Even Green, in his "History of the English People"—a work remarkable for its scholarly and lucid style—speaks of the capture of Louisberg (*sic*) by Amherst and Wolfe as "a brilliant success," but he forgot in the previous part of his work, when writing of the year of Fontenoy, of its successes and failures, to mention the triumph of the colonial troops on the western

continent. The writer has now before him a new encyclopædia[1] just issued by the European press, and turning to the subject of Louisbourg we find that "it was strongly fortified under the French but was taken by the British in 1763"—a statement not only remarkable for the omission of any mention of 1745, but for the inaccuracy of the date given in the second instance. *Sic transit gloria mundi*, especially when the matter is one requiring some knowledge of the history or the geography of a colony.

As respects Pepperrell and Warren, it is not necessary for us to depreciate the claims of one, in order to elevate the reputation of the other. We know as a matter of fact and not of controversy that the expedition was conceived, carried out, and actually on its way to Louisbourg before Warren made his appearance. In fact, when it had started, Pepperrell heard of the refusal of the English Commodore to sail without orders, and there was no guarantee that he would come at all. Like a true English sailor, when he joined the expedition he supported it with all his energy and ability. Without his blockade of the port, the Vigilante could not have been taken. In fact, so effective was the blockade, that during the siege only one small vessel, "a snow" from Bordeaux, succeeded in eluding the vigilance of the fleet, and entering the port on a dark and stormy night. His presence not only gave confidence to the colonial troops but worried the garrison, who felt that as long as his fleet lay off the harbour there was little prospect of aid reaching them from Canada or France. All the heavy and dangerous work, however, fell on the colonial troops, and had it not been for their successful efforts to erect a battery on the Lighthouse Point, and mount it with cannon under great difficulties, they would never have been able to weaken the island battery so as to enable the fleet to take part in the general assault that was contemplated when Duchambon decided to surrender the town. All that Warren was able to do for the land forces in the conduct of the siege operations was to send them a few gunners and supplement their supply of powder which very soon ran short.[2] On the other hand, it is fair to state that had not the colonial expedition received the hearty co-operation of the fleet, the result would have been problematical, though, when we consider the spirit that prompted the colonial expedition and the determination that was exhibited from its beginning to the capture of the fortress, we can well believe that they would not hastily have given up the contest. All this, however, is mere speculation in the face of the fact that the colonial troops achieved a brilliant victory as a result of their hardihood and pluck, and while Warren did his duty as a brave sailor and his fleet was most necessary to the success of the expedition, it is after all to the land force and not to him that the chief honour is due. It was then only an act of justice to the English Commodore that when he presented himself with General Pepperrell in Boston, nearly a year later, that they should be both handsomely received and publicly thanked by the general council of Massachussetts' Bay for the great services they had rendered to England and her colonial peoples.

Great dissatisfaction was felt in consequence of the army receiving no share whatever of the great treasure which was captured in the Délivrance and other ships, and was divided between the Crown and the British officers and sailors in accordance with the ordinary naval rules, which might well have been modified under the exceptional circumstances. The colonial forces were also disappointed in the amount of booty they found in

[1] "The Modern Cyclopædia," (London 1890-91) edited by Charles Annandale, M.A., LL.D.

[2] See App. X to this work.

Louisbourg, where the inhabitants were for the most part poor and had few valuables which their captors could steal; but as a matter of fact Pepperrell and Warren promised that the inhabitants and their families could depend "on meeting the best treatment, nor shall any person be suffered to give them the least disturbance." Not only were the colonial troops disappointed in not finding any "loot"—to use a word familiar a century later—but the government of Massachusetts saw itself in extreme financial difficulties, largely on account of the heavy expenditures incurred by an already crippled province for the Louisbourg expedition. It was not until over three years had passed away and it was decided to restore Cape Breton to the French, that the imperial government found it expedient to appease the colonists by reimbursing them for their expenses in winning a victory, rendered worthless by the treaty of Aix-la-Chapelle. In 1749, the sum of £183,649 sterling arrived in Boston, in the shape of six hundred and fifty three thousand ounces of silver, and ten tons of copper, which were carried in waggons through the streets of Boston and subsequently divided among the governments of New Hampshire, Rhode Island, Connecticut and Massachusetts—the latter deservedly and legally receiving the greater portion. Those were days of paper money, when men thought they could get rich and pay their debts by the fresh issues of paper whenever the treasury was empty, and chiefly owing to the efforts of Thomas Hutchinson, the historian, a wise and energetic public man who was speaker of the house of representatives at the time, and subsequently royal governor and chief justice during his residence in the colony, the money paid to Massachusetts was used to buy up and cancel the depreciated paper currency.[1]

Before we resume the history of Cape Breton and narrate the events in Europe which led to its eventually becoming a permanent possession of England, it is but due to the men who took part in this memorable episode of colonial history to tell something of their subsequent career. The colonial forces, for the greater part, were obliged to remain in Louisbourg all the following winter until the arrival of a garrison of regular troops from England. Immediately after the fall of the town, the weather, which had been remarkably free for seven weeks from fogs and rain, became damp and unhealthy, with the unfortunate effect that the troops, worn out by fatigue for weeks, succumbed to dysentery, and several hundreds found a grave on a point of land between the town and the rocky beach, known as Point Rochefort. In the spring, as soon as troops arrived from Gibraltar, Warren and Pepperrell, who had acted as joint governors until that time, went to Boston, and, after receiving the thanks of the citizens, the former proceeded to England. Before this, however, he had been promoted for his services at Louisbourg to the rank of rear admiral of the blue. In 1747 he distiguished himself in the great naval fight off Cape Finisterre, in which he and Anson defeated a large French fleet under Jonquière and St. George. A monument to his memory in Westminster Abbey, that Walhalla of England's great men, tells us that he died in the forty-ninth year of his age, "a knight of the Bath, vice-admiral of the red squadron of the British fleet, and member of parliament for the city and liberty of Westminster."[2] Captain Tyng, who commanded

[1] See Parson's "Life of Pepperrell," 207; "Hutchinson's History" ii. 394-396; "Appleton's Cyclopædia of American Biography," art. "Hutchinson."

[2] Usher Parsons, in his "Life of Pepperrell," is not correct when he gives a baronetcy to Warren. Belknap, "History of New Hampshire," ii. 223, makes the same mistake. Murdoch quotes the epitaph in Westminster Abbey (History, ii. 69-111), and says that the distinction of the Bath was "but rarely bestowed" in those days.

the naval contingent of the New England expedition, does not afterwards appear in the history of the times; but the officer next in rank, Captain Rous of the Shirley galley, a two-masted vessel, with twenty-four guns, was of great assistance to the royal sloop Mermaid in the capture of the Vigilante,[1] and after the capture of the town he carried duplicate despatches communicating the news to the government of England, where his vessel was taken into the British service, and he himself received a commission as post captain in the royal navy. He took part in various expeditions for the reduction of French America, and assisted in the second siege of Louisbourg. It was on board his ship that General Wolfe issued his last order before proceeding to ascend the heights of Quebec. He became, in later life, a member of the executive council of Nova Scotia, and settled in the city of Halifax, at the foundation of which he was present as a commander of one of the ships that accompanied Governor Cornwallis to the province. Of all the officers of the colonial land forces General Wolcott was the most advanced in years, but he lived to speak of this memorable expedition until the ripe age of eighty-nine, and to fill the responsible position of governor of his province.[2] His name has been rendered famous, not only by his part in the Louisbourg siege, but by his grandson, who was one of the signers of the declaration of independence. Lieutenant-Colonel Moulton, who had seen much service in the wars with the Indians previous to 1745, filled several important positions in the town of York, a place full of historic memories, in the state of Maine. Among the tombstones of the burying ground, where the grass grows rank and matted, there is one on which can still be deciphered, with a little trouble, the name, and part of the epitaph, of one of those stern old Puritan ministers who accompanied the expedition to Louisbourg. The whole epitaph once read as follows:

"Here lies the body of the
REVD. SAMUEL MOODY, A. M.
The zealous, faithful, and successful pastor of the
First Church of Christ in York.
Was born in Newbury, January 4th, 1675.
Graduated 1697. Came hither, May 16th.
Died here November 13th, 1747.
For his further character read the 2nd Corinthians,
3rd chapter and first six verses."

This old clergyman of York, an uncle of Mrs. Pepperrell, appears to have been remarkable for the length of his prayers, and it is related of him, that, when he was called upon to ask a blessing at a banquet given by the general to his officers at Louisbourg, in celebration of its capture, the guests awaited his performance with fear and trembling; but greatly to their surprise, instead of the long, tedious grace they expected, he contented himself with a few memorable words which appear now to have given him a position in history that none of his prolix sermons or supplications could possibly have done.

[1] A galley is described as usually a snow, as the largest two-masted vessels were often called, and would seem to have carried all her guns on a continuous deck, without the higher tiers at the end, which was customary with frigates, built low only at the waist. See Preble, "N. E. H. & Gen. Reg.," 1868, p. 396, cited by the "Nar. & Crit. Hist. of Am.," v. 438, *n.* C. H. Smith (*ib.* 411) has inaccurately given credit to Tyng for this exploit.

[2] Mr. D. Brymner ("Can. Archives," 1886) appears to think Wolcott was governor when he joined the expedition; the best authorities mention him as deputy-governor.

"Good God," he said, "we have so many things to thank you for, that time will be infinitely too short to do it; we must therefore leave it for the work of eternity. Bless our food and fellowship upon this joyful occasion, for the sake of Christ our Lord, Amen."

Lieutenant-Colonel Meserve, who originated the plan of moving the cannon and heavy material of war by sledges, was engaged in 1756 in the expedition commanded by Abercromby and Winslow and subsequently took part in the second siege of Louisbourg in charge of a number of ship carpenters with the rank of Colonel — he being himself a ship carpenter by vocation—and died there from an attack of small pox, which also carried off many others. Colonel Bradstreet made his name famous in after years by his military genius, first developed in the siege of Louisbourg. He became governor of Newfoundland, and was actively engaged in the campaign for the reduction of French Canada. In 1759 he took and destroyed Fort Frontenac on Lake Ontario which, says the eminent historian of those times, was "the heaviest blow, next to Louisbourg, that the French had yet received," since it meant that "their command of Lake Ontario was gone," and "New France was cut in two and unless the severed parts could speedily reunite, all the posts of the interior would be in imminent jeopardy."[1] Colonel Richard Gridley, who was the artillery man of the Louisbourg expedition *par excellence*, distinguished himself at Bunker Hill when in later times, the same undaunted class of men who followed Pepperrell to Cape Breton stood so successfully the shock of their first great encounter with the regular forces of England. Brigadier-General Waldo, who was third in rank at Louisbourg, commanded one of the Maine regiments which formed part of the unsuccessful expedition that Massachusetts organized in 1746 and 1747 under the inspiration of Shirley, for the object of laying siege to Crown Point, and died on the eve of the great struggle which ended in the loss of Canada and Louisiana to France. Colonel Titcomb who gave a name to one of the most important works of the besieging forces, served in the Seven Years' War and died a soldier's death in the memorable battle at Lake George, where William Johnson[2] of New York—a nephew of Admiral Warren and a famous character in colonial history—and Phineas Lyman of Connecticut—a lawyer by profession and a soldier by the necessity of those times—defeated the Baron Dieskau at the head of a large force of French and Indians.

Nor can we well pass by, in this connection, the name of another officer—Captain Cobb of a Massachusetts regiment—who afterwards took part in the siege of 1758, and occupied a somewhat prominent place in the early history of Nova Scotia. Sylvanus Cobb of Plymouth, New England—sometimes incorrectly called Sylvester—was a captain in Gorham's force. It is said that his company was the first that appeared in Boston in response to the call for men to take part in the expedition. He served with distinction throughout the siege and subsequently remained in the public service of Nova Scotia. He commanded a provincial armed vessel that was ordered to cruise in 1747-8 in the Bay of Fundy. In 1758 he conducted Wolfe to make a reconnaissance of Louisbourg. As they neared the shore under a heavy fire—the General and Cobb alone standing on the deck, the latter at the helm—General Wolfe observed that they had approached as near

[1] Parkman, "Montcalm and Wolfe," ii. 129.

[2] Usher Parsons is incorrect in saying (p. 352) that Sir W. Johnson was appointed "governor of Upper Canada, 1796." General Simcoe was lieutenant-governor of that province at that time. See "Cyclopædia of Am. Biography" (Art. Johnson) where the inaccuracy is pointed out.

as he wished for his purpose. Cobb made another tack, and as they went about the General remarked, "Well, Cobb, I shall not doubt that you will carry me near enough." Cobb went back to Plymouth after the campaign, but he was heard of subsequently at Liverpool, in Nova Scotia, where he is said to have built a house. He died of a prevalent epidemic at the siege of Havana in 1762, expressing his regret that he had not met a soldier's fate at the cannon's mouth.[1]

The leader of the New England forces, without whose personal popularity, excellent judgment, and cool courage the expedition could never have been successful, was rewarded by the English government with a baronetcy, the first distinction of the kind ever given to a colonist. His subsequent public career until his death at the age of sixty-three, on the 6th of July, 1759—only a few years before the outbreak of the war of independence—was distinguished by the same fidelity to the British crown and affection for his native country, that had induced him to attach himself to the expedition of 1745 He gave up his time and expended much of his money in assisting his countrymen in their effort to drive France from America, and through his instrumentality one of the finest frigates in the British navy, the America, was built in a shipyard of New England and a royal regiment raised to assist in the operations in North America. No man ever died more universally regretted in the English colonies than this eminent representative of the sturdy and resolute New England character. He died before he saw his country precipitated into a war with England which he loved and revered. His only son had died in early manhood, and his once great possessions, which stretched for nearly thirty miles from the Piscataqua to the Saco, were scattered by confiscation and sale among those who did not bear his name. His grandson, William Pepperrell Sparhawk, whose mother was the only daughter of Sir William, and who had been adopted by his grandfather as heir to his estate, on condition of dropping the name of Sparhawk, was permitted eventually to bear the title as a reward for having remained faithful to England during the trying times before the war of independence.[2] He lived the greater part of his life in England—from 1775 to 1816, when he died—where he received a pension from the government, and was always noted for his kindness and hospitality to all his countrymen who claimed his aid and sympathy. Two of the older Sir William's descendants — his daughter's grandsons—in later times were "only saved from the poorhouse by the bounty

[1] His only daughter married Colonel W. Freeman of Liverpool, N.S.; their descendants are well known in the western part of that province. His younger brother, Jabez, also settled at the same place. See Bissell's "History of Plymouth," 189; Murdoch, "Nova Scotia," ii. 348; Akins's "Archives of N.S.," 182 *n.*

[2] In more than one American account of Sir W. Pepperrell there is an error as to the way the grandson obtained his title. Parsons (p. 337) writes of the old baronet, on the death of his son Andrew, having adopted his grandson "as heir to his estate and title," and adds that the latter actually succeeded to the title in October, 1774. As Sir William's only son died unmarried, and his grandson, William Sparhawk, was only the *second* son of his daughter, the title became extinct on his death, since it could descend by heirs male alone. If the grandson had had a legal right to the title, it would have descended to him in 1759, when his grandfather died, and not, as Parsons says, in 1775. The fact is, he received the title fifteen years after Sir William's death as a reward for his fidelity to English connection. He inherited the estate in accordance with his grandfather's will, and assumed the name of Pepperrell by an act of the Massachusett's legislature. See Ward's account of the Pepperrells in the appendix (p. 619) to "Journals and Letters of Samuel Curwen" (ed. of 1864). In Appleton's "Cyclo. of Am. Biog." it is actually stated that the grandson assumed his grandfather's title by an act of the colonial legislature, when not even the imperial parliament could have conferred such a dignity—it is a prerogative of the sovereign, "the fountain of honour" under the English constitution.

of some individuals on whom they had no claim for favour."[1] His tomb even was neglected for years, until at last it was repaired by a New England lady who claimed a connection with his family, and it is now an object of interest to the curious tourists who frequent the pleasant summer resort that has grown up in the vicinity of his old home on the picturesque shore of "hundred harboured Maine."[2]

France had heard with dismay of the loss of Cape Breton which she now recognized as the key to her possessions on the St. Lawrence, and made two efforts to recover it before the war closed in 1748. One of the noblest fleets that ever sailed from the shores of France, under the command of M. de la Rochefoucauld, the Duke d'Anville, was scattered to the winds while on its way to the island, and the unfortunate admiral himself died of an apoplectic seizure while counting his losses in the harbour of Chebouctou.[3]

The unfortunate nobleman was a member of one of the oldest and most illustrious families of France, immortalized by the author of the famous maxims and memoirs which still remain unequalled for their literary taste and style, and their wealth of astute and practical philosophy. While distinguished for a highly cultured mind, he appears to have had no experience at sea, though he had entered the naval service of France at an early age. It is easy to understand that the disasters that overwhelmed his noble fleet should have so disturbed his sensitive brain as to cause his sudden death. Canadian historians have heretofore given his place of burial as a small island at the entrance of Halifax harbour, generally believed to be George's Island where Cornwallis in 1849 landed a number of settlers and a fort was subsequently erected for the protection of the new town. It has, however, recently come to light that the duke's body was not allowed to remain for any long time on English soil. It appears from an official report of Monsieur Desberbiers[4] who became governor of Cape Breton after its formal surrender in the July of 1749, that he obtained a promise from Colonel Hopson, the English governor of the island, that the duke's remains should not be disturbed at Chebouctou, but that they should be sent to Louisbourg, if the place of burial could be found. This promise, the French governor

[1] Parson's "Life of Pepperrell," 328.

[2] S. A. Drake, "Nooks and Corners of the New England Coast," (N.Y., 1875) p. 147. In App. IX and X to this work is given a bibliographical and critical review of the English and French authorities on the siege of 1745.

[3] The news of the sailing of this expedition created great consternation in New England, and towards the end of September, says an eye witness, Dr. William Douglass, author of "Summary of the British Settlements" (See App. X to this work) "6400 men from the country, well armed, appeared on the Boston Common; some of them from Brookfield travelled 700 miles in two days, each with a pack (in which was provision for 14 days) of about a bushel corn weight." Supplications went up from all the pulpits for assistance in the hour of need, and Rev. Thomas Prince, who had a year before preached a thanksgiving sermon on the fall of Louisbourg (See App. X.) now fervently prayed in the old South Church at Boston, when he heard the windows rattle with the coming of the storm.

"Oh Lord! we would not advise,
But if in thy providence
A tempest should arise,
To drive the French fleet hence,
And scatter it far and wide,
Or sink it in the sea
We should be satisfied,
And thine the glory be."

This was the prayer I made,
For my soul was all on flame,
And even as I prayed,
The answering tempest came.
It came with a mighty power,
Shaking the windows and halls,
And tolling the bell in the tower,
As it tolls at funerals.

—From Longfellow's "Ballad of the French Fleet," October, 1746; Mr. Thomas Prince loquitur. See Prince's "Thanksgiving Sermon on the Salvation of God in 1746" (Boston, 1746.)

[4] Quebec Documents, iii. 455-456.

informs us, was promptly kept. The ship Grand Esprit, in the month of September, brought the body to the French port, where it was received with all the honours which were due to the rank and birth of so distinguished a man. It was buried in the parish or king's chapel, at the foot of the altar in the sanctuary, with all the solemn ceremonial of the Roman Catholic Church; and here his dust, in the course of years, mingled with the ruins of the citadel which was levelled to the ground when the fortifications were destroyed in 1760.

But the misfortunes of the French did not cease with the sudden death of the unlucky duke. His successor, M. d'Estournelle, committed suicide in a fit of despondency, and the remnant of the great fleet which was to restore the fortunes of France in America returned home without having even succeeded in capturing the half-ruined fort at Annapolis. Another fleet under M. de St. George and the Marquis de La Jonquière—the latter of whom had accompanied the former fleet and was afterwards governor of Canada—never reached its destination but was defeated, as already stated, off Cape Finisterre by admirals Anson and Warren, and it was for his services on this occasion that Warren was made a knight of the Bath.

VI. Review of events from the restoration of Cape Breton to France in 1748 until the second siege and taking of Louisbourg in 1758.

But while storm and battle kept the French from Cape Breton, English diplomacy, careless of colonial interests, restored the island to France by the treaty of Aix-la-Chapelle [1] in return for the commercial post of Madras which had been captured by the French in the east where England and France had already obtained a foothold. It is asserted that extremely unfavourable accounts, given of the island by Commodore Knowles,[2] who succeeded Pepperrell and Warren in the government of Louisbourg, had some influence on the British ministry in inducing them to give it up so hastily; but in all probability while they attached little importance to a spot which they believed to possess a barren soil and exposed to constant fog and storm, it was the persistency of the French to regain possession of so valuable a bulwark to their great dominion in Canada that forced the English ministry to restore it at a time when the nation was disheartened at the results of the war on the continent and inclined to call a truce.

It was only a truce in Europe, "a mere pause in the struggle, during which both parties hoped to gain strength for a mightier conflict which they saw impending." [3] In America it was not even a cessation of hostilities until the war was again formally proclaimed between France and England in 1756. If we briefly survey the situation previous to the great contest which ended in the destruction of Louisbourg, and in the loss of Canada to France, we can see that the latter had been steadily aiming for years to attain the supremacy in America. During the two decades which preceded the loss of

[1] See App. XVI to this work for text of this treaty so far as it relates to Cape Breton.

[2] This was the same Knowles, afterwards Admiral, who on a visit to Boston in November, 1747, sent a press gang ashore to seize men for his ships, in place of a number who had deserted on their arrival. A serious riot was the result, and Knowles was obliged to let most, if not all, of his recruits go, while he sailed off with his squadron. Hildreth, "Hist. of the U. S.," ii. 399-400; Hutchinson, "Hist. of Mass.," ii. 386-388.

[3] Green, "History of the English People," iv. 164.

Canada she was fortunate at having at the head of affairs in that country men of cool judgment, admirable sagacity and national ambition like La Galissonnière, Duquesne and Montcalm. The bravest of them all, Montcalm, was destined by relentless fate to efface forever by his death on the battlefield those plans of supremacy in America which the men who preceded him in New France had conceived and inscribed on the early page of Canadian history. Ill-supported as La Galissonnière and Duquesne were by the king and his ministers, engaged in a colossal and losing struggle in Europe, and more ready to listen to the blandishments of mistresses like the false, worthless Pompadour, than to the claims for aid of the struggling colonists in America, they carried out their design of establishing France in America with great skill and energy, despite the relatively feeble means at their command. We have already seen how much had been achieved before the first fall of Louisbourg in establishing forts and means of communication between the distant possessions of Canada and Louisiana, and confining the English colonists between the Alleghanies and the sea. If we take up a map of the continent as it appeared seven years after the restoration of Cape Breton to France, we see clearly outlined her ambitious designs in the construction of forts and posts at particular points, chosen with great discretion, on the great lakes, in the Ohio and Mississippi valleys, and at the entrance of the Gulf of St. Lawrence. Conscious of the mistake that was made in restoring Acadie, they now claimed that its limits did not extend beyond the isthmus of Chignecto, and proceeded to construct the forts of Gaspereau and Beauséjour on that neck of land, and also one on the St. John river, so that they might control the land and sea approaches to Cape Breton from the St. Lawrence, where Quebec, enthroned on her picturesque heights, and Montreal, at the confluence of the Ottawa and the St. Lawrence, held the keys to Canada. The approaches by the way of Lake Champlain and the Richelieu were defended by the fort of St. John, at the northern extremity of the lake, and by the more formidable works known as Fort Frederick or Crown Point—to give the better known English name—at the narrows towards the south. The latter was the most advanced post of the French until they built Fort Ticonderoga or Carillon on a high, rocky promontory at the head of Lake Sacrament, afterwards called Lake George by General Johnson—a sheet of water always famed for its picturesque charms. At the foot of this lake, associated with so many memorable episodes in American history, General Johnson, in 1755, erected Fort William Henry, about fourteen miles from Fort Edward or Lyman, at the great carrying place on the upper waters of the Hudson. Returning to the St. Lawrence and the lakes, we find Fort Frontenac, already mentioned, at the eastern end of Lake Ontario, where the old sleepy city of Kingston now stands. At the other extremity of this lake was Niagara, the most important key to the west. At Detroit, Mackinaw and the Sault the French continued to hold possession of the great lakes. Their communications, then, between the head of Lake Superior and Quebec were perfect, but between the great valleys of the St. Lawrence and the Mississippi, over which they claimed exclusive rights, there was another valley which became of great importance in the execution of their scheme of continental dominion. This was the valley of the Ohio, into which the adventurous men of Pennsylvania and Virginia were already slowly feeling their way in the years succeeding the peace of Aix-la-Chapelle. Virginia had received from the Iroquois a deed which gave it, as its rulers believed, a sound title to the Great West, and a company was already formed to occupy Ohio. It was in this valley that we

find the famous son of Virginia, George Washington, first entering upon the theatre of national action, and endeavouring to vindicate the claims of his countrymen to that rich region. The astute Duquesne, in furtherance of the plans of his able predecessor, La Galissonnière, built posts at the northwest approaches of the Ohio, and seized the Virginian forts at the forks of the river, where the French erected a fort to which they gave the name of the French governor of the day.[1] The French and English colonies joined issue in this valley, which formed so necessary an avenue of communication between Canada and Louisiana; and when the Seven Years' War broke out the French had won the mastery, and their line of communications was complete from the Gulf of Mexico as far as the shores of Acadie and Cape Breton, by means of a chain of forts at points in the Mississippi, the Ohio and the St. Lawrence valleys; in fact, from New Orleans to Louisbourg.[2]

The French Canadian plans were developed by high statesmanship and carried out with military genius, and had there been enough men in Canada to hold the country and contend against the combined forces of England and her colonies, the dominion of France might have been assured in America. The thirteen colonies might well fear the future, as they saw their security threatened by the posts of France slowly closing around them, shutting them out of the Ohio valley and on the way to confine them to the narrow range of country which they occupied between the Atlantic and the Alleghanies. Happily for the future destiny of the English colonies, Canada was very much inferior in wealth and resources to those countries, and incapable of carrying on a long and exhaustive struggle, while France, busy with her ambitious designs in Europe, gave but a meagre support to the men who had dreams of founding a mighty empire in America. When France and England met for the last great struggle in America, the thirteen colonies had reached a population of nearly a million and a quarter of souls, exclusive of the negroes in the south, while the total number of the people in Canada and Louisiana did not exceed eighty thousand. In wealth and comfort there was the same disproportion between the French and English colonies. The foreign trade of the thirteen colonies in 1753—that is to say, of the imports and exports—was estimated at over three million pounds sterling, while the commerce of Canada could not have exceeded half a million of pounds. The combined forces of Canadian militia and regular troops were always much inferior in number to the British and colonial armies when united for the invasion of Canada, with the support of a powerful fleet; but the great strength of the French colony lay in the natural barriers between the English colonies and the keys to New France, Quebec and Montreal, and in the skill with which the approaches by way of Lake Champlain had been defended by forts at every important point. If the French force was insignifi-

[1] For an interesting statement of the French posts in America at the time of the final struggle for the supremacy on the continent, see Hinsdale, "The Old Northwest," i. 64.

[2] See Map No. 1 of Northern New France, showing the position of the French posts and forts from Louisbourg to the Mississippi and the Ohio, with the dates of their foundation. I am indebted for the main outlines to the map given in Parkman, "Montcalm and Wolfe," vol. i. Hinsdale has also a map (vol. i, frontispiece) giving dates of forts, but they are not quite accurate. For instance, the date of Montreal is given at 1611, whereas M. de Maisonneuve founded Ville Marie in 1642. (See Faillon, "Histoire de la Colonie Française en Canada," i. 439 *et seq.*) No doubt Mr. Hinsdale has been misled by the fact that Champlain in 1611 commenced a clearing on the island of Montreal at a point called La Place Royale, but nothing came of his scheme of making an establishment there. It was on the same spot that Maisonneuve erected the first fort for the protection and shelter of his little colony. (Faillon, i. 124-132.) But that does not give Champlain any valid claim to be the founder of Ville Marie.

cant in number, they were as a rule skilfully managed, and in the early part of the struggle the English had no commander to compare with Montcalm for military genius. If there had been even a quarter million of people in Canada the contest could never have ended so suddenly on the heights of Quebec. In some respects the French Canadians were more manageable in war than the English colonists. They had none of that independence of feeling and disposition to rebel against military discipline that was often shown by the English colonists, especially of New England, when they accompanied the regular forces on a campaign. The French Canadians were always ready to obey the orders of their military governors and chiefs. No legislative bodies existed in Canada to interfere with and thwart the plans and orders of military commanders, but the whole Canadian people acted as a unit to be moved and directed at the will of the king's officers. The Indian tribes from Acadia to the Mississippi, the Ohio and the Illinois were, with the exception of the Five Nations, always friendly to the French since the days of Champlain—the warm allies of a people who fraternized naturally with them, and it would have been an unhappy day for the English colonists had eighty or a hundred thousand Canadians been able to arm and, under the skilful generalship of Montcalm, swoop down with their savage allies on the English colonial settlements. But the French of Canada were never able, as a rule, to do more than harass, by sudden raids and skirmishes, the English of America, and at no time in colonial history was the capture of Boston or of New York by a land force from Canada among the possibilities. The great current of active thought and enterprise which developes a nation was always with the English colonies, and though large schemes of ambition stimulated the energies of the bold and adventurous men to whom the destinies of France were entrusted from the days of La Salle to those of Montcalm, their ability to found a new empire in America under the lilies of France was ever hindered by the slow development of the French settlements, by the incapacity of the king and his ministers in France to grasp the importance of the situation on this continent, and by their refusal to carry out the projects of men like the astute La Galissonnière, who at once recognized the consequences of such neglect and indifference, but found no one ready to favour his scheme of establishing large settlements of French peasantry in Canada and Louisiana. France, we see now, had her great opportunity in America, and lost it forever at Quebec in 1759.

Before we proceed to the record of the second fall of Louisbourg—the first in a chain of events which led to the conquest of Canada—it is necessary that we should briefly review the history of the period which elapsed between the treaty of Aix-la-Chapelle and the commencement of the Seven Years' War. When English statesmen were informed of the mistake they had made in restoring Cape Breton to France with such reckless haste, they began to reflect on the best means of retrieving it as far as possible; and at the suggestion of Shirley and other colonists they set to work to bring an English population into Nova Scotia and to make it a source of strength instead of weakness to the New England communities. In 1749, the year of the formal surrender of Louisbourg, the city of Halifax was founded on the west side of the harbour, long known in Acadian history as Chebouctou—a harbour remarkable for its spaciousness and freedom from ice in winter. Here, under the directions of Governor Cornwallis, a town slowly grew up at the foot and on the slopes of the hill, which was in later times crowned by a noble citadel, above which has always floated the flag of Great Britain. Then followed the erection of a fort

at Chignecto, known as Fort Lawrence in honour of the English officer who built it—afterwards governor of Nova Scotia and one of the commanders at Louisbourg in 1758—and intended to be a protection to the province, constantly threatened by the French and Indians, who were always numerous at the French posts and settlements on the isthmus. The French constructed on the northern bank of the Missiquash a fort of five bastions known as Beauséjour, and a smaller one at Bay Verte, with the object, as previously stated, of keeping up communications with Louisbourg, which they were strengthening in some measure. At Fort Beauséjour the treacherous Le Loutre continued to pursue his insidious designs of creating dissatisfaction among the French Acadians and pressing on them the necessity of driving the English from the former possessions of France. In the spring of 1755 an English force of regular and colonial troops, chiefly the latter, under the command of Colonel Monckton, who has given his name to a prosperous city on the isthmus, and of Colonels Winslow and Scott, captured the two French forts, and took a good many prisoners, among whom were a considerable number of French Acadians, induced by the French to assist in the defence of Beauséjour. Le Loutre succeeded, during the confusion on the surrender of the fort, in evading capture, but only to find himself eventually taken prisoner by an English ship while on his way to France, and sent to the island of Jersey, where he was kept in confinement until the end of the war, and from that time disappears from colonial history.[1] During this same year General Braddock met with his terrible disaster in the forests west of the Alleghanies, and the Ohio valley was, for the time being, secured to the French. An expedition, led by Shirley against Fort Niagara, never reached its destination through various misadventures, and another force under Johnson and Lyman defeated Dieskau, but was unable to achieve the object for which it was formed, the reduction of Crown Point. But the most memorable event of the year, which has been the subject of warm controversy between French and English historians and the theme of one of the most affecting poems in the English language, was the expulsion of the Acadian French from Nova Scotia. When Halifax was founded it was decided, as a matter of necessity, to bring the Acadians more entirely under the control of the English authorities. They had probably increased since the treaty of Utrecht to at least ten thousand souls, living for the most part in the Annapolis valley, on the Gaspereaux and Avon rivers, at Grand Pré, at Mines, and at Chignecto. When they were asked to take the oath of allegiance by Governor Lawrence, they refused to do so unless it was qualified by the condition that they should not be obliged at any time to take up arms. It will be remembered that many years before a considerable number, if not the majority, of the same people had taken this qualified oath, although no one had legal authority to make such a condition with them.[2] The feeling of uneasiness that the presence of so

[1] Dr. Akins in one of his notes to his "Selections from Nova Scotia Public Documents" (p. 178) gives a resumé of the leading facts in the life of this inveterate foe of England, who made use of the Acadians most unscrupulously to carry out his insidious designs of driving the English from Acadia. Parkman in describing his character (Montcalm and Wolfe, i. 113, 114) says he "was a man of boundless egotism, a violent spirit of domination, an intense hatred of the English, and a fanaticism that stopped at nothing." He appears to have been a treacherous soldier in the guise of a priest. His ecclesiastical superiors rebuked him in vain—he cared little for their approval, and looked only to the support of the military chiefs like Galissonière, who encouraged him in his schemes against England.

[2] "In a single instance—in 1729—Governor Philips secured from the French inhabitants of the Annapolis river an unconditional submission; but with this exception the French would never take the oath of allegiance without an express exemption from all liability to bear arms. It is certain, however, that this concession was

large a body of people, undoubtedly, and naturally, in sympathy with the French, had always created among the English colonists, was not only intensified by the obstinacy of the Acadians in this particular, but by the knowledge that a number of them had been actually captured at Fort Beauséjour with arms in their hands. The people of England were much prejudiced against them, and believed that they could never enjoy any security while the Acadians continued to maintain their attitude of nominal neutrality, but actually of secret hostility to England. They had always supplied Louisbourg with provisions and helped to build the French forts on the isthmus, and it was difficult for Lawrence and his officers to obtain any assistance from them in the same way. The war between the French and English had never really ceased in America, and it was well known that the hollow truce in Europe would be broken at any moment; and in the presence of the great danger that threatened the English colonies, they had some ground for fearing the presence of a large body of people who assumed the extraordinary and unjustifiable position of neutrals in a country which was England's by rights of conquest and treaty, and where they could and did enjoy an amount of political and religious liberty which no Protestant enjoyed in Catholic Europe. The English authorities refused to allow them time to remove to French territory under the natural fear that such a step would only directly strengthen the French in Canada. The position of this people in Acadia, it is well to remember, would have been very different from that afterwards occupied by the French Canadians during the war of independence. In the one case it was a war between England and their old mother France, and it would have been difficult for them to refuse to listen to emissaries, who would be certainly urging them to take up arms for the restoration of the old *régime*. Their neutrality, under all the circumstances of the case, would have been extremely trying; indeed, in this last supreme struggle their hearts would lead them to take a part. In the second case, France had disappeared to all intents and purposes from the new world, and the war was between England and her own children in America, and there was no possible hope of restoring the old days of French dominion, but, on the contrary, the people saw in the Quebec Act the evidence of a unanimous desire to treat them justly. But while there are some extenuating circumstances to mitigate the unfavourable verdict which history seems generally disposed to pass against the English authorities for this hasty expatriation of the Acadian French from their homes in their old Acadian land where they had been living since the days of De Poutrincourt and La Tour, one will always regret that the men who represented England in those days had not run a risk on the side of human clemency, rather than have driven thousands of men, women and children from their pleasant homes by the sides of the beautiful bays and rivers of Nova Scotia, and scattered them far and wide among the English colonies, where they were so many sad-hearted exiles and unwelcome strangers, to whom charity too often doled out a pittance with a reluctant hand.

In 1756 the war between France and England was publicly proclaimed. In Europe the four great powers of France, Spain, Russia and Austria combined to crush Frederick the Great, whose sole ally was England. The basis of the present German Empire was laid on the field of Rossbach where the great representative of Protestantism defeated and

never made by anyone in authority; and in the two instances in which it was apparently granted by subordinate officers, their action was repudiated by their superiors." "Nar. and Crit. Hist. of Am.," art. on "The Struggle in Acadia and Cape Breton," v. 409.

almost annihilated the French army by an effort of the most remarkable military genius that the world has ever witnessed, but it is not in the old world, with its conflict of dynasties and national ambitions, that the war resulted in consequences of the most moment to mankind. If Frederick prepared the way for the unity of Germany by his successes, we must at the same time place among the results of the Seven Years' War the conquest of that wondrous eastern empire which, from the earliest times, has attracted the admiration of nations. India with its great shrines of faiths, which were old when christianity came to purify the world by its humanizing influences, with its glittering stores of diamonds and its barbaric ornaments of gold and silver to excite the rapacity of conquering armies, with its palaces and monuments of curious architectural skill—India was won at Plassy by the genius of Clive; and now from Ceylon to the Himalayas an English viceroy represents English order and law in his white marble palace on the banks of the Hughli. One hundred and thirty years after the victory of Plassy there was living in this eastern palace a viceroy[1] who had come there direct from the old French province in America,—from that Canadian country which, under the rule of England, has grown up to a vast dominion extending between two oceans since the days when it was won on the field of Abraham by Wolfe, whose name must always be associated with Quebec just as the memory of Clive must ever live in the great province of Bengal. India, the United States, and the Dominion of Canada are the heritage of the war which drove France from the eastern and western hemispheres.

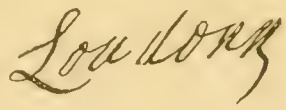
Whilst Frederick was laying the foundations of an empire, which was a century later to hurl a French emperor from his throne and inflict a tremendous blow on the pride of France, the conflict between England and her great rival in America was chiefly remarkable for the incapacity of English commanders on land and sea. Earl Loudoun[2] the commander-in-chief, arranged a campaign against the French on Lake Champlain and against Louisbourg which ended only in disaster and humiliation for England. The forts at Oswego, the most important on the frontiers of the English colonies, and always regarded with great disfavour by the French who occupied Fort Frontenac on the opposite side of Lake Ontario, were successfully attacked and destroyed by Montcalm. The energetic French general then proceeded, a year later, to storm Fort William Henry and largely owing to the incapacity or pusillanimity of General Webb who could have marched to the assistance of the besieged from Fort Edward, the brave Scotch officer, Lieutenant-Colonel Monro, then in command of this important defence of the northeastern frontier, was obliged to surrender. After the capitulation of this fort a large number of helpless men, women and children were barbarously murdered by the body of Indians that accompanied the French—one of the saddest episodes in American history, which must always dim the lustre of Montcalm's victories, though it is now generally admitted that the French general himself was not responsible for the treachery of his Indian allies, but used his most earnest efforts—even at the risk of his own life—to save the English when the savages were mad with lust for the blood of their enemies.[3]

[1] This special reference here is to Lord Dufferin, who was a very popular governor-general of Canada from 1872 to 1878, but in addition to him two other distinguished governors-general have occupied the same exalted position—Lord Elgin thirty years ago, and the Marquess of Lansdowne since 1888.

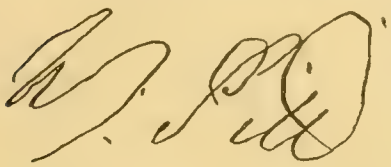
[2] Of whom it was said "he is like St. George on the signs; always on horseback, but never rides on," Franklin's Autobiography (Sparks), vol. i. p. 219.

[3] See Parkman's graphic account of this disgraceful affair, "Montcalm and Wolfe," i. 474–514. Capt. Jonathan Carver has a narrative of the massacre ("Travels through the Interior Parts of North America," ed. of 1779, pp. 295–308), to which he nearly fell a victim.

At sea the results were equally discouraging for the English. Fifteen ships of the line and three frigates, under the command of Admiral Holbourne, and twelve thousand troops under the command of Earl Loudoun himself, assembled in the harbour of Halifax in the July of 1757, but owing to the absence of energy and celerity of movement from the very day the project was decided upon in England, until after the arrival of the fleet in America, the French were able to get reinforcements of ships and men into Louisbourg, and the English admiral and general came to the resolve—so strange for Englishmen in time of war—to run no risk in attacking the fortress. Loudoun returned to New York but too late to retrieve the injury he had done to the northern colonies by withdrawing so large a force from the frontier at a critical period, when Montcalm was marching on Fort William Henry with such unfortunate results for the English interests. Holbourne sailed with his fleet for Louisbourg, and after an unsuccessful half-hearted attempt to draw the French fleet, then safely moored under the guns of the town, into an engagement even the elements combined against him, and when he had lost a number of his vessels on the rocky Cape Breton coast, he returned to England to tell the story of his discreditable failure.[1]



It was time indeed that the genius of Pitt should be enlisted in the service of his countrymen. The qualities of a mere political trickster like the Duke of Newcastle were not those that could save England in this hour of her necessity, when her colonies in America were threatened by the intrepidity and skill of the men who were endeavouring to carry out the bold designs of France with the limited resources that their country placed in their hands. Pitt possessed all the qualities necessary at this national crisis. His impassioned eloquence touched a sympathetic chord in the hearts of his countrymen. His self-confidence inspired hopefulness in all those with whom he conferred. His cool judgment and energy of character enabled him to carry out successfully the bold designs his fertile brain conceived. His popularity rested not on the favour of the aristocracy, but on the support of the great middle class of the people. It happened with England then, as it happens almost always in a great national emergency. The necessities of the times gave birth to a man capable of coping successfully with the difficulties of the situation. It was Pitt's good fortune to control the destinies of England at a time when she was entering on the most remarkable epoch of her history; an epoch which was to be famous for victories in Asia and America, would place her in the foremost rank of nations, and make her the centre of a vast colonial empire such as the world never saw, even in the days when Rome was mistress.[2]



When Pitt was recalled to office in July 1757, it was too late to prevent the humiliation of England through the incompetency of Holbourne, Loudoun and Webb, and the

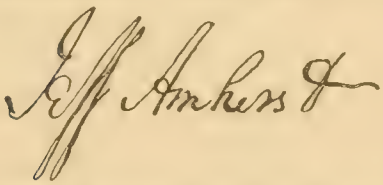
[1] See App. X, (last paragraph,) to this work for reference to authorities on this unfortunate expedition.

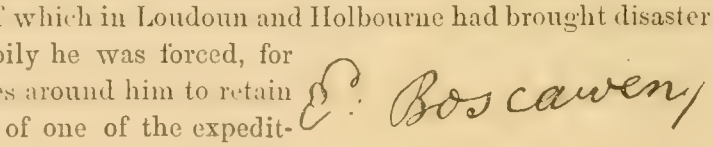
[2] "When the disasters of the war drove Newcastle from office, in Nov., 1756, Pitt became secretary of state, bringing with him into office his relatives, George Grenville and Lord Temple, as well as Charles Townshend * * The House was full of Newcastle's creatures, the King hated him, and only four months after taking office he was forced to resign. The Duke of Cumberland insisted on his dismissal in April, 1757, before he would start to take the command in Germany. In July, however, it was necessary to recall him. The failure of Newcastle's attempt to construct an administration forced the duke to a junction with his rival, and while Newcastle took the head of the treasury, Pitt again became secretary of state." Green, "Hist. of the English people," iv. 177. The same historian has an excellent review of Pitt's character and ability, pp. 177-183.

year 1757 closed with Montcalm triumphant in America. But while France, governed by an impure woman, neglected to give adequate support to her brave sons in Canada, England rallied to the support of Pitt and the whole nation felt a confidence in the future which it had not felt for many years under the administration of his predecessors. On the continent of Europe Pitt contented himself with giving the largest possible subsidies of money to his great ally, Frederick, and by entrusting the command of the English and Hanoverian forces to the best of his generals, Ferdinand Prince of Brunswick, in place of the incompetent Duke of Cumberland. The victories of Rossbach, Leuthen and Minden were the answers that Frederick gave to the great English minister for the confidence he reposed in his ability to cope with the four great powers, then combined with Saxony to destroy Prussia and bring England to the feet of France, by invading her territory and marching into her very capital. Hanover was saved by the memorable victory on the Weser, and England was spared the humiliation and perils of an invasion by the destruction of a French fleet by Admiral Hawke in Quiberon Bay.

VII. Siege and Taking of Louisbourg in 1758 by Amherst and Boscawen.

While the military genius of Frederick and the inspiring statesmanship of Pitt were successfully thwarting the ambitious plans of France and her allies in Europe, the English minister had decided on a vigorous campaign in America.[1] With that intuitive sagacity which he possessed above most men for recognising ability in others for the purpose in view, he chose General Amherst, Admiral Boscawen and Brigadier-General Wolfe as possessing those qualities, the want of which in Loudoun and Holbourne had brought disaster upon the English arms. Unhappily he was forced, for the time being, by strong influences around him to retain General Abercromby at the head of one of the expeditions in America, but he hoped with others that the advice and co-operation of Lord Howe would keep up the courage of the army, and prevent any blunders on the part of the slow and obtuse soldier in command. The plan of the campaign which opened in 1758 was to send three expeditions simultaneously against the three all important French positions held by the French in the Ohio Valley, on Lake Champlain and at the entrance of the Gulf of St. Lawrence. General Forbes, a resolute Scotch veteran, was to march on Fort Duquesne, General Abercrombie was to lay siege to Crown Point and Ticonderoga, and General Amherst with Admiral Boscawen was to attack the fortress of Louisbourg, which was acknowledged as the key of the St. Lawrence. That formidable fortress once reduced, the French would have no place of rendezvous at the mouth of the gulf, and the English





[1] "He [Pitt] felt that the stake he was playing for was something vaster than Britain's standing among the powers of Europe. Even while he attacked Frederick in Germany, his eye was not on the Weser but on the Hudson and St. Lawrence." Green, "Hist. of the English People," iv. 195. See Parkman, "Montcalm and Wolfe," i. 39, 40; ii. 380.

fleet and army could proceed with greater security to the siege of the capital of Canada, on whose rocky heights the French believed themselves almost impregnable.

Whilst Louisbourg had been in the possession of the English until the peace of Aix-la-Chapelle, they had repaired the breaches in the walls besides erecting a large wooden barracks in the Queen's bastion, but it does not appear that they strengthened the fortifications in any essential respects. When the French regained possession of the town, the engineer Franquet was sent out by the government of France for the purpose of making it more capable to resist the attack which they knew must be made upon it some time or another. An additional battery of twenty guns was erected at Point Rochefort, and another at the lighthouse to command the shipping and assist the island battery in protecting the entrance to the harbour. Both of these defences had been contemplated in the original plan of the works, but they were not constructed when Louisbourg was first besieged by the New England troops. The original plan also contemplated a battery of fifteen guns near the entrance, to the southwest of the careening cove, but it does not appear to have been built before the second siege. Between the Maurepas and Princess bastions there was constructed a curtain of masonry and another between the Princess and the Queen's bastion as those were relatively weak portions of the defences. It may be that Franquet was not well qualified to perform the task assigned to him, but at all events there is some probability in the accusation which French writers have made that there was great neglect on the part of the officers in charge of the works, as well as peculation practiced by the officials generally.[1] On the whole, we may come to the conclusion that while there were doubtless defects in the fortifications, from the causes just stated, it is quite certain that they were in a much better condition to stand a prolonged siege than in 1745. The fortifications were well defended by cannon and mortars, and there was a large fleet in the port and a considerable force of regular soldiers and militia in the town, although, as the issue proved, the whole strength of Louisbourg was quite unequal to keep up a defence for any length of time against the military skill which led the English army and fleet. Had France been able to cope with England on the sea, Louisbourg might never have fallen and Canada have been saved to France, or, at all events, it would not have passed so easily into the possession of England. The fleets that were intended for the relief of Canada were intercepted and defeated by the naval skill and indomitable courage of the English sailors. The incompetency and pusillanimity shown by Holbourne, when it was contemplated to attack Louisbourg in 1757, were very rare in English naval annals. Indeed, Admiral Byng was sacrificed to the public opinion of the day that if English sailors were beaten there must be gross negligence or cowardice, only to be wiped out by disgrace and death. In 1757, Admiral Osborn prevented a French fleet from passing through the Straits of Gibraltar on its way to America, while Admiral Hawke forced another, just sailing to Louisbourg, to find protection under the guns of the fort of Aix and in the shallow waters of the Charente. Had these naval expeditions reached Canada, Quebec and Louisbourg might have long resisted the attacks of the English naval and military forces, but happily for Boscawen and Amherst, only a few ships had arrived at Louisbourg before the English fleet anchored in Gabarus Bay at daybreak on the 2nd of June.

[1] See the very unfavourable estimate of Franquet and the officials generally in a memoir attributed to a Scotch soldier of fortune, Chevalier Johnstone—App. IX to this work.

When this event happened, there were in the harbour fourteen French men of war; two carrying 74 guns each, four 64, one 50, three 36, one 32, one 30, and two 16, or an aggregate of five hundred and sixty-two guns. Nearly three thousand men composed the crew of these vessels, which, had they been managed with the same intrepidity and skill which the garrison of the town displayed, Amherst and Boscawen would have found the task before them much less easy of accomplishment. The governor and commandant, Chevalier Drucour, had under his orders a regular force of about three thousand four hundred men, besides officers, and seven hundred militia drawn from the inhabitants of the island, beside a considerable band of Indians whose exact number has not been ascertained, but probably exceeding three hundred in all.[1] In addition to these fighting forces, there was in the town a population of four thousand persons, men, women and children belonging to Louisbourg and adjacent harbours. Since 1749, when the island was given up to the French, the French population of the island had considerably increased, and there were altogether in 1758 from three to four thousand people living at Louisbourg, Port Toulouse, Spanish Harbour, St. Anne's, Mira, Ile Madame, Inganiche, and Labrador as the Bras d'Or was then called. Communication had been opened with Port Toulouse, the most populous and flourishing settlement outside of Louisbourg, at a very great expense, by the Count de Raymond, when governor of Cape Breton, but all the writers who refer to this subject unite to condemn it as a useless expenditure, calculated to give facilities to an enemy to attack Louisbourg by land and obtain possession of the heights which command the town. The town was well supplied with provisions and military stores, as the English found after the capitulation. The walls were defended by two hundred and eighteen cannon and seventeen mortars, and there were forty-four large cannon in reserve for a time of need.

The English naval and military forces that made their appearance off the Bay of Gabarus on that June day were the most formidable in ships, men and armament that have ever appeared in the eastern waters of the Dominion. The naval force was composed of twenty-two ships of the line, sixteen frigates, a sloop or corvette, and two fire-ships, which carried in the aggregate eighteen hundred guns, and was under the orders of the Hon. Edward Boscawen, who hoisted his flag as admiral of the blue on the Namur, a noble ship of ninety guns. The second in authority was Sir Charles Hardy, vice-admiral of the white, whose pennant flew from the masthead of the Royal William, a ship of eighty guns. One hundred and twenty transports carried a train of artillery and some companies of colonial rangers and of carpenters — the latter under the Colonel Meserve

[1] The French forces, exclusive of inhabitants and Indians, were composed as follows:

	Men.
Twenty-four companies of infantry and two companies of artillery	1,200
The Second Battalion of the Regiment of Volontaires Etrangers	600
" " Artois	500
" " Bourgogne	450
" " Cambise	650
Total.....	3,400

Brown ("Hist. of Cape Breton") and Parkman ("Montcalm and Wolfe") differ as to the number—the former giving 3,400 and the latter 3,080. Murdoch ("Hist. of Nova Scotia") agrees with Brown. The author of the account of the siege, generally attributed to Chevalier Johnstone, (see App. IX to this work) places the strength of the regiments at 3,740 ("Quebec Doc.," iii. 485.)

already mentioned in the account of the first siege. These forces were under the command of General Amherst, and were divided into three brigades, under the orders of Brigadier-Generals Whitmore, Lawrence and Wolfe, respectively.[1]

The expedition reached its destination full of enthusiasm and without any accident after leaving Halifax. Soldiers and sailors had complete confidence in their officers, among whom Wolfe already occupied a conspicuous position for his great courage, his remarkable resolution and energy, despite his feeble health, and his determination to win fresh laurels for his country on a continent where its armies had so far met with few successes. The issue proved that Pitt had made a wise choice when he took that young soldier as the hope of England in the conflict which was now to be fought out to the bitter end on the continent of America.

Although the fleet arrived off Gabarus Bay on the 2nd of June, it was not until the 8th of the same month that a landing could be effected. It is rarely that there is no surf rolling on the noble beach of shingle and sand that stretches for several miles around the

[1] The following is a list of the ships composing the English fleet:

The Namur	90 guns	..	Admiral the Hon. E. Boscawen. Capt. Buckle.
Royal William	80 "	..	Rear-Admiral Sir Chas. Hardy. Capt. Evans.
Princess Amelia	80 "	..	Commodore Philip Durell. Capt. Bray.
Terrible	74 "	..	Capt. Collins.
Northumberland	70 "	..	" Lord Colville.
Vanguard	70 "	..	" Swanton.
Oxford	70 "	..	" Spry.
Burford	70 "	..	" Gambier.
Somerset	70 "	..	" Hughes.
Lancaster	70 "	..	" Edgcumbe.
Devonshire	66 guns	..	Capt. Gordon.
Bedford	64 "	..	" Fowke.
Captain	64 "	..	" Amherst.
Prince Frederick	64 "	..	" Mann.
Pembroke	60 "	..	" Simcoe.
Kingston	60 "	..	" Parry.
York	60 "	..	" Pigot.
Prince of Orange	60 "	..	" Ferguson.
Defiance	60 "	..	" Baird.
Nottingham	60 "	..	" Marshall.
Centurion	54 "	..	" Mantell.
Sutherland	50 "	..	" Rous.

The Dublin, 74, which brought Amherst to Louisbourg was sent back to Halifax, and the general went on board the Namur. In addition to the large ships, there were the frigates Juno, Gramont, Nightingale, Hunter, Boreas, Hind, Trent, Port Mahon, Diana, Shannon, Kennington, Scarborough, Squirrel, Hawk, Beaver, Tyloe (sloop-of war) and Halifax; the Etna and Lightning fireships, and 118 transports, carrying the following land forces, according to Brown in his "History of Cape Breton," p. 295:

1st	Regiment,	Royals	854	45th	Regiment,	Warburton's	852
15th	"	Amherst's	763	47th	"	Lascelles'	856
17th	"	Forbes'	660	48th	"	Webb's	932
22nd	"	Whitmore's	910	58th	"	Anstruther's	615
28th	"	Bragg's	627	60th	"	2nd Battalion, Monckton's	925
40th	"	Hopson's	655	60th	"	3rd " Lawrence's	814
35th	"	Otway's	565	78th	"	Frazer's	1084

Also five companies of Rangers, a brigade of artillery and engineers and 200 carpenters, altogether exceeding 12,000 men, exclusive of officers and troops left for the defence of Halifax, consisting of the 43rd Regiment, under Colonel Kennedy, of 659 men, and detachments from the 1st, 29th, 35th, 45th, 47th, second battalion of 60th and 78th Regiments, and artillery, in all 1,600 men. Brown's account differs from Parkman, "Montcalm and Wolfe," ii. 56, who puts the whole force of soldiers, including Provincial Rangers, at 11,000. Entinck, "Hist. of the Late War," iii. 221-222, gives the number at 11,936; Knox, in his "Journal," i. 127, at 11,112, besides officers, artillery and Rangers. Murdoch, "Hist. of Nova Scotia," ii. 337, follows Entinck, and adds 324 artillery, or 12,260 in all. Mante, "History of the War," is probably correct in the statement that only 9,900 were fit for duty.

Entinck, (iii. 227, *n.*) describes as follows an important part of the land forces: "Our light infantry, Highlanders and Rangers, the French termed the English savages, perhaps in contradistinction to their own native Indians, Canadians, etc., the true French savages. * * * Some were dressed in blue, some in green jackets and drawers, for the easier brushing through the woods, with ruffs of black bear-skins round their necks; the beard of their upper lips, some grown into whiskers, others not so, but all well smutted on that part, with little round hats like several of our seamen. * * * The Rangers are a body of irregulars, who have a more cut-throat savage appearance, which carries in it something of natural savages; the appearance of the light infantry has in it more of artificial savages."

exposed bay which has witnessed two of the most memorable episodes in the history of British North America. A southeast wind invariably makes a landing almost impossible for days. In curious contrast with the good fortune that attended Pepperrell's expedition, the weather was in every respect unfavourable for nearly a week. The commanders were eagerly looking every day for an opportunity of obtaining a footing on the rocky coast which was defended at important points for five miles by batteries constructed of earth and trees, so arranged as to conceal a large force of some three thousand regulars, inhabitants and Indians, which Drucour had stationed on the appearance of the fleet to prevent a landing. At last, on the 8th, the weather became sufficiently favourable, and the three brigadier-generals in command of their respective divisions made all their arrangements for a landing.[1] In order to distract the attention of the French from Freshwater or Kennington Cove, where it was decided that Wolfe should make the real attack, the divisions under Lawrence and Whitmore proceeded at first as if they intended to try a landing at Flat Point and White Point. Freshwater Cove was defended by a large force of French commanded by Colonel St. Julien, and hidden behind intrenchments cunningly devised of spruce trees with their tops outwards so as to deceive an enemy at very close quarters, and the moment the English came within range of the guns they met a furious fire from the French. Wolfe faltered before the fierce cannonade and actually gave the signal to retreat, but by one of those remarkable incidents that sometimes change the whole current of events three of his officers in the boats, Lieutenants Hopkins and Browne, and Ensign Grant—whose names deserve to be always remembered—misunderstood the signal, advisedly it is thought, and took it as an order to advance quickly. Consequently they moved forward impetuously and succeeded in landing on some rocks which were so situated as to protect them for the moment from the fire of the batteries to their left. The little body of a hundred men, under the command of these three officers, succeeded in obtaining a foothold among the rocks, and here they were joined without loss of time by reinforcements under the orders of Wolfe who, like a skilful general, at once seized the advantage which had been accidentally won for him. A Major Scott was one of the first to obey the orders, and although he found himself in face of a force very much greater than his little band of ten that he rallied around him on the rocks he succeeded in maintaining his position until his comrades joined him and enabled him to drive off his assailants who were coming up in hot haste to crush him. From the moment the English made a stand among the rocks, Wolfe recognized the necessity of supporting the movement and the first success was won. The batteries were very soon taken and the French seen in full retreat on Louisbourg with a loss of seventy-four prisoners, including two captains and a considerable number of killed and wounded—probably less than one hundred—whilst the English loss was fifty killed and fifty-nine wounded, a small loss when we consider the risk they ran in attacking a large body of well-armed

[1] The first or right division was composed of detachments of the 1st, 17th, 47th, 48th, 58th and 60th Regiments, led by Brigadier-General Whitmore, Colonels Burton and Foster, and Majors Prevost and Darby.

The second or centre division consisted of detachments of the 15th, 22nd, 35th, 40th, 45th and 60th Regiments, under Brigadier-General Lawrence, Colonel Wilmot, Lieutenant-Colonel Handfield, Majors Hamilton and Hussey.

The third or left division was made up of the 78th Highlanders, five companies of Rangers, twelve companies of Grenadiers, and a corps of Light Infantry consisting of 550 of the best marksmen to be found in the different regiments, led by Brigadier-General Wolfe, Colonels Frazer, Fletcher and Murray, and Majors Scott, Murray and Farquharson. See Entinck, ii. 227, 228; Brown, 298.

men successfully concealed behind cleverly constructed earthworks. By the evening of June the 8th the troops were landed on the shore of Gabarus Bay, but it was not for several days later that the artillery and stores could be successfully taken ashore at Flat Point Cove in consequence of the bad weather and heavy surf.

The encampment of the army was made on a range of low rocky hills just beyond the reach of the artillery of the town. The lines commenced at Flat Point Cove and formed almost a quarter circle of about two miles. The headquarters were placed at the centre of the encampment which had the advantage of not only the vicinity of a stream of fresh water but was almost invisible from the fortifications on account of the lay of the land. As soon as the French found that the English had landed their forces, they destroyed the grand battery, spiked the guns in the lighthouse battery, and burned down the storehouses and other buildings around the harbour. General Wolfe immediately proceeded to the lighthouse point, and took possession of the battery where he mounted cannon for operations against Goat Island opposite. He established a base of operations at the little harbour of Lorembec in his rear and erected a battery close to the careening cove to harass and destroy the shipping in the port.

It took several weeks to land all the stores, to build block-houses and redoubts, dig trenches, and make the investment complete.[1] By a month's time, however, despite the furious fire kept up day after day by the besiegers, the investment was complete and the situation may be generally described as follows:—

At sea the fleet under the command of Admirals Boscawen and Hardy effectually blockaded the port.

At lighthouse point, and half a mile to the westward of the careening cove, there were two batteries armed with heavy cannon.

The lines of the encampment to the west of the town were protected by two block-houses on the left flank to prevent any attack on the rear.

Wolfe constructed another block-house on the Mira road, to secure communication between the camp and the northeast arm where there was stationed a small detachment of troops. Three redoubts were erected about nine hundred yards in front of the camp to protect it from any attacks in that direction

The first parallel or intrenchment was constructed from the water's edge east of the barachois for a distance of five hundred yards and came within six hundred yards of the nearest salient of the King's bastion. To give easy and secure access to this work an epaulement or rampart was constructed of earth and sods mixed with gabions and fascines, its height being nine feet, its width sixty feet, and its length a quarter of a mile.

The second line of trenches was next constructed to the east of the barachois for a distance of six hundred yards, within four hundred yards of the walls.

The third line of entrenchments was pushed forward from the extremity of the second line towards the left in an oblique direction, and when completed came to within sixty yards of the glacis of the Dauphin bastion.

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[1] I have not given a special plan of the operations of this siege, as it seems superfluous to give another map of the harbour and fortifications in addition to those appended to this work. By reference to the plan of the siege of 1745 the reader can easily follow the short account I have given of the operations of 1758. I do not attempt to do more than describe the salient features of this siege.

A fourth redoubt was built on a little acclivity called Green Hill in the vicinity of the extremity of the epaulement to the first parallel

A fifth redoubt was built by Wolfe on the north side of the harbour at the head of the barachois on a little rising ground, and did very effective work against the Dauphin bastion.

A sixth redoubt and entrenchment were constructed from six to seven hundred yards of the Queen's and Princess's bastions to divert the attention of the besieged as far as possible from the Dauphin's and King's bastions, the chief points of attack.

The work of constructing the trenches in front of the foregoing bastions was greatly facilitated by the fact that Wolfe on the 16th day of July obtained possession of a rising ground, known as *hauteur de la potence* or Gallow's Hill, not far from the curtain between the west gate and the King's bastion. Here the English were able to entrench themselves scarcely three hundred yards from the Dauphin bastion, and approach eventually within two hundred yards of the ramparts.

At the very commencement of the operations roads were constructed from Flat Point Cove to the headquarters and to the redoubts on Green Hill, in the direction of the first parallel.

All these works took several weeks to construct amid all the difficulties arising from bad weather and the nature of the ground, which made the construction of roads and the hauling of the heavy guns and materials very laborious. Indeed the last trench was not really finished until the day before the town itself capitulated. In the mean time, however, the besieging force drew nearer every day, and the town was practically condemned before the construction of the last parallel, as it will be easily seen when we review the main features of the siege, which lasted in all forty-eight days from the landing on the shores of Gabarus Bay.

The cannon on Wolfe's batteries on the rocky hills at the entrance of the harbour, soon silenced the island battery and forced the French ships to draw closer under the guns of the fortifications. When the island battery was destroyed, Governor Drucour recognized the danger of the English ships coming up the harbour, and sank four ships across the entrance, with their masts fastened together by a strong chain. Subsequently, considering this protection insufficient, he ordered two other ships to be added to the number. By this time there were only four ships of the line and one frigate in the harbour.[2] Two ships, the Bizarre and the Comète, had succeeded in getting out of the port soon after the commencement of the siege, and another, the Echo, also escaped the guns of the lighthouse battery but only to fall into the hands of the blockading squadron. The Aréthuse, a frigate of thirty-six guns, commanded by a gallant officer named Vauquelain, was for some time anchored close to the barachois at the southwest end of the harbour, and greatly harassed the besiegers engaged in the trenches and other works. If the Marquis Desgouttes, who commanded the fleet, had shown the same courage and resolution which Vauquelain displayed, the English would have found their progress greatly retarded, but he notoriously exhibited either great pusillanimity or remarkable incapacity. At the very beginning he wished to make an effort to return to France, and when Mon-

[1] The "British Encyclopædia" (9th ed.) commits a blunder in saying that "the siege operations were brought to a successful issue after an investment of six months."

[2] For a list of the fleet in the port in the first week of June, and the fate of the vessels, see next page.

sieur Drucour refused to grant him permission to leave the fortress to its fate, he allowed the great proportion of the officers and crews of the ships to find shelter in the town, to the discontent of the garrison who found them of relatively little use in the defence. The commander of the Aréthuse, however, soon found his position near the barachois too hot as the redoubts and works of the English made progress, and after making some repairs to the vessel, he succeeded in evading the English fleet and reaching France, though he fell subsequently into the hands of the enemy whilst cruising in the Channel. Of the five ships that remained in the harbour, three were afterwards destroyed by fire which originated from a bomb which fell upon one of them from the English batteries. The two remaining vessels, the Prudent and the Bienfaisant, were captured during the night by six hundred sailors under the command of Captains Lefroy and Balfour, and despite the perfect rain of missiles from the French batteries the Englishmen destroyed the former as soon as it ran aground and carried the other successfully out of the harbour.[1] Then not a single man of war was left out of the fleet of fourteen vessels that had hoisted the French flag at the commencement of the siege.[2] It is rarely that one is called upon in the history of naval warfare to record a more signal destruction of a squadron which effected nothing for the defence and is only redeemed from the charge of cowardice or of remarkable feebleness by the bravery of Vauquelain, who proved that had he been in command, instead of incompetent Desgouttes, he would certainly have shown that there were enough brave men in the little fleet to vindicate the honour of the French flag and give substantial aid to the hard pressed garrison.

Day by day the lines grew closer to the falling town, the breaches in the fortifications became larger, great masses of wall began to tumble, and the cannon were dismounted and rendered useless. Several sorties were attempted, but only one against the sixth redoubt and entrenchment, constructed by Wolfe to the westward of Black Point, had any success. The French surprised a company of grenadiers that were stationed in these

[1] "The renowned Captain Cook, then serving as a petty officer on board of one of the British ships of war co-operated in this exploit, and wrote an account of it to a friend in England," Grahame's "United States," iv. 28. Cook subsequently distinguished himself at Quebec and in Newfoundland, of which he explored the interior, then entirely unknown to the world. See "Encyclopædia Britannica," 9th ed., which, while giving a very accurate account of his great services as a navigator, does not notice his presence at Louisbourg in 1758.

[2] The following statement shows the names of the French men of war in Louisbourg, June 1, 1758, and their subsequent fate:

La Prudent,	74 guns,	burned by English in the harbour.	Le Bizarre,	64 guns	escaped.
L'Entreprenant,	74 "	blown up by accidental explosion.	L'Apollon,	50 "	sunk at entrance.
Le Capricieux,	64 "	set on fire by foregoing accident.	La Diane,	36 "	" "
Le Célèbre,	64 "	set on fire by foregoing accident.	Le Fidèle,	36 "	" "
Le Bienfaisant,	64 "	captured by English in harbour.	La Chevre,	16 "	" "
			La Biche,	16 "	" "
			L'Aréthuse,	36 "	escaped.
			L'Echo,	32 "	captured while attempting to escape.
			Le Comète,	30 "	escaped.

The foregoing statement is made up from the most authentic sources. It appears that six vessels were sunk at the entrance of the harbour by the governor's orders—five men of war as above, and another, either La Ville de St. Malo (a merchantman) or an English prize, to which allusion is made in the memoir attributed to Chevalier Johnstone (App. IV.), The same memoir gives the number of sunken ships at five, but Drucour and others place it at six altogether—four on the first occasion and two subsequently. Parkman ("Montcalm and Wolfe" ii. 54 *n.*) gives an imperfect list of the ships in the port, the Diane being omitted. Murdoch ("Hist. of N. S. ii. 337,") is also incorrect in some particulars.

works, and although it was much inferior in numbers, it kept back the assailants until they were drawn off by reinforcements from headquarters. In this affair there were considerable losses in killed and wounded on both sides, Lord Dundonald, who commanded the grenadiers, and three captains of the French force being among the number. The situation of the French in the town became more desperate every day, and there was no prospect of aid coming to them by land or sea. A French officer, M. de Boishébert, was during the greater part of the siege at Mira with a force of at least three thousand French and Indians, mostly from St. John's Island, but the English had warning of their approach on the night of the 11th of July, and a detachment under Major Sutherland easily beat off the advance party—not more than one hundred men, it is said,—and that was the last that was heard of M. de Boishébert and his companions. So furious was the fire of the besiegers' batteries that it destroyed the greater portion of the stone citadel, affording accommodation for the principal barracks, a chapel and the governor's quarters, the last being alone saved from the flames. Bombs and shells fell even into the hospital, so that the surgeons were obliged to stop constantly in the performance of their operations. The large wooden barracks in the Queen's bastion was burned, and even the casemates in the King's bastion, in which the women and children huddled together, became unsafe. When at last the fortifications were tumbling down in all directions on the west front, and great gaps were visible in the Dauphin's, Queen's and King's bastions and not more than a dozen cannon were reported as really serviceable, the French governor decided to capitulate. The crisis had come at last in the siege. The English admiral and general had determined on a general assault when M. Drucour came to this conclusion. At first he asked for the same honours of war that the French had granted to General Blakeney and his garrison at Port Mahon in 1756, but the general and admiral would not entertain the proposition. The governor was prepared to maintain the siege still longer, and sent a messenger to communicate his intention to the English. Then M. de Prévost, the intendant, on behalf of the citizens, strongly urged him to surrender, as it was clearly impossible to hold the town for any length of time, and the consequence of further resistance would be a useless waste of life. The messenger was recalled before he reached the English headquarters and authorized to take back an answer accepting the terms which Amherst and Boscawen had laid down in the first instance. These terms provided that the troops in Louisbourg and St. John's Island should be prisoners of war and be carried to England in British ships, that the artillery and stores of all kinds in the islands in question should be delivered up, and that the inhabitants of the colony who had not carried arms should be sent to France at the first opportunity. On the morning of the 27th of July the English took possession of the west gate, and the cross of St. George was hoisted on the ramparts of a fortress whose days of glory were ended, and which was destined very soon afterwards to disappear from the pages of history.[1]

[1] Articles of capitulation between their Excellencies Admiral Boscawen and Major-General Amherst and his Excellency the Chevalier Drucour, governor of the island of Cape Breton, of Louisbourg, the island of St. John and their appurtenances:

"I. The garrison of Louisbourg shall be prisoners of war, and shall be carried to England in the ships of his Britannic Majesty.

"II. All the artillery, ammunition, provisions, as well as the arms of any kind whatever, which are at present in the town of Louisbourg, the islands of Cape Breton and St. John's and their appurtenances, shall be delivered, without the least damage, to such commissioners as shall be appointed to receive them, for the use of his Britannic Majesty.

The English obtained possession of 221 cannon, 18 mortars, 7,500 muskets and a great quantity of stores and provisions; 5,937 officers and men, of whom 3,301 were soldiers and 2,606 sailors, became prisoners of war. In addition to the men under arms there were in the town a large number of inhabitants, merchants and fishermen with their families, and these persons were eventually sent to La Rochelle, in France, and Louisbourg forever bade farewell to the people who had been living for years under the flag of France and sharing her fortunes on the American continent.

England had won her first great success on this continent in the campaign commenced under the inspiration and genius of Pitt. The news was received in America and England with many rejoicings, and the eleven stands of colours that were won at this gateway of Canada were deposited in St. Paul's Cathedral amid the roar of cannon. Thanksgivings were offered to heaven from the Puritan pulpits of New England, loyal toasts were drunk round many a festive board in New York and Philadelphia, bells pealed from the towers and steeples, towns were illuminated from Maine to Virginia; and in the English posts

English medal struck on capture of Louisbourg.[1]

of Acadia, in the camp of Lake George, where Abercromby was fretting under the humiliation of defeat, wherever the tidings came, Englishmen rejoiced and predicted a speedy end to French power in America.

When we recall this victory of the Seven Years' War let us not forget to do justice to the men who achieved it. Wolfe distinguished himself from the beginning to the end of the siege and was the soul and impulse of the enterprise.—

> "Wolfe where'er he fought,
> Put so much of his heart into his act,
> That his example had a magnet's force,
> And all were swift to follow whom all loved."

"III. The governor shall give his orders that the troops which are in the island of St. John's and its appurtenances shall go on board such ships of war as the admiral shall send to receive them.

"IV. The gate called Port Dauphin shall be given to the troops of his Britannic Majesty to-morrow, at eight o'clock in the morning, and the garrison, including all that carried arms, drawn up at noon on the Esplanade, where they shall lay down their arms, colours, implements and ornaments of war. And the garrison shall go on board to be carried to England in a convenient time.

"V. The same care shall be taken of the sick and wounded that are in the hospitals as of those belonging to his Britannic Majesty.

"VI. The merchants and their clerks that have not carried arms shall be sent to France in such manner as the admiral shall think proper."

Murdoch, "Hist. of Nova Scotia," ii. 343-344, and Entinck, "Hist. of the Late War," iii. 246-247, give the articles of capitulation in full.

[1] From the collection of Mr. McLachlan, Montreal. See App. XIII to this work, No. 8 medal on list.

Amherst and Boscawen conducted their expedition with skill and prudence, and the number of their men killed and wounded during the operations was exceedingly small—five hundred and twenty-one in all.[1] The French, on the other hand, lost according to the English accounts upwards of one thousand, although the Chevalier Drucour represents the number at only three hundred and thirty, but he does not include the crews of the ships. The French governor, it must be admitted, conducted the defence with great energy, and he was well supported, according to his own statement, by the garrison, who, despite the great dangers and discomforts to which they were subject during the operations, "did not display the least discontent." The governor could not praise "too highly the exertions of the officers who had defended the town and had done their best to delay the surrender." Frenchmen and Englishmen, all accounts of the siege tell us, emulated each other in paying the tribute of their admiration to Madame Drucour, wife of the governor, who, during the siege, even fired off cannon with her own hand to nerve the soldiery to fresh efforts, and who was able when the fight was over to obtain some favours for her countrymen in recognition of the respect entertained for her courage and patriotism by the English general and admiral.[2] If M. de Drucour was unable to prevent the town falling into the hands of the English, at all events he succeeded in protracting the siege so that it was impossible for the expedition to proceed up the St. Lawrence to attack Quebec with any prospect of victory that year; and indeed he states in his report of the siege that he had this object steadily in view while engaged in the defence of the fortress.

Comparing the facts of the siege of 1758 with those of 1745, it must be admitted that Pepperrell's success was the more remarkable of the two. In the one case we see a famous admiral and experienced generals, skilled in the art of war on land and sea, at the head of a great force of soldiers and sailors, of an army of twelve thousand well trained soldiers,

[1] Killed, 21 officers, 150 privates; wounded, 30 officers, 320 privates. Wright's "Life of Wolfe," 455, *n.*

[2] One must regret that Dr. Kingsford, in his History of Canada, should have thought it necessary to devote a long foot note—a page almost—to throw doubt on the often quoted story of Madame Drucour's courage and devotion during the siege. (See vol. iv. 142.) It is true, as he says, Pichon is the authority generally cited for the statement, but there is no reason to doubt its truth since he was certainly not disposed to pay many compliments to his countrymen, and had opportunities to hear stories of the siege from participants both on the English and French side that the Canadian historian certainly has not had. Canadian history records the story of Madame de La Tour (Hannay's Acadia, 170-172), who defended the French fort on the St. John against her husband's foe, D'Aulnay de Charnisay. An American writer, Mary Hartwell Catherwood, has recalled Madame de La Tour's devotion to her husband's cause and the treachery of his relentless enemy in a romance, true to history, and full of the light and colour of the past,—"The Lady of Fort St. John" (Boston, 1890). We find on record many other evidences of the devotion of the Canadian women of old to King and Country. Every Canadian remembers the story of the heroine of Verchères. (See "The Heroines of New France," by J. M. LeMoine, in "Canadian Leaves," or a series of papers read before the Canadian Club of New York; New York, 1887.) But Pichon is not the only French writer who refers to this interesting episode. The Abbé Raynal, who wrote his "Philosophical and Political History" at a time when he probably heard the story from a French witness of the siege, refers to the incident. "Madame Drucour," he says, "was constantly on the ramparts, *with her purse in her hand*, and, firing herself three guns every day, seemed to dispute with the governor, her husband, the glory of his office" The words in italics (ignored by Dr. Kingsford) are not in Pichon's relation, and go to show that Raynal had probably other authority for his statement. Wright in his "Life of Wolfe," p. 444, quotes from "Anecdotes Americaines," Paris, 1776. Under all these circumstances why doubt Madame Drucour's heroism when no statement to the contrary can be found anywhere? That Wolfe did not mention the story in his letters is no evidence in favour of Dr. Kingsford's contention. Wolfe's letters are hastily written and show irritability of temper. It is a pity that the Canadian historian was not more chivalrous in view of the fact that he has no evidence on his side when he assumes the rôle of a doubting Thomas. Parkman ("Montcalm and Wolfe") relates the incident and bears testimony to the courtesy with which the English commanders treated the brave woman.

and of a fleet of at least fifty war vessels, the noblest that ever appeared in American waters; with officers thoroughly trained in the use of artillery, and with a great store of all the machinery and munitions of war necessary to the reduction of a fortified town. In the other case, we see a relatively insignificant body of men, a little over four thousand all told, without regular military training, unskilled in siege operations, poorly provided with cannon, tents and stores, perfectly ignorant of the use of heavy artillery, and led by men taken from the counting house and farm. These colonial troops were supported by a few small vessels of their own, and an English squadron which consisted of only four vessels at the commencement and did not exceed nine vessels, including the captured Vigilante, at the close of the siege. It is true that in 1745 the walls were not in as good condition to undergo a protracted siege, and the French garrison was chiefly composed of colonial militia. Duchambon had no fleet to assist him, but it must be admitted that with the exception of the Aréthuse the vessels in the harbour in 1758 were of no material aid to Drucour. Still despite the great odds in favour of the second expedition the siege lasted for as many days as that conducted by Colonel Pepperrell. M. Drucour was a more efficient commander than Duchambon and had the assistance of a fine body of officers and regular troops, and was able to prolong the siege much longer than the other could possibly have done under the circumstances. The weather too was favourable for the success of the colonial expedition, but curious enough during the progress of the second siege it was remarkable for rain, fog, and wind. However, despite the good fortune that attended the efforts of the colonists in this and other respects, their success deserves mention among the most remarkable enterprises of the war. If we compare the operations during the two sieges, it will be seen that Amherst and Wolfe closely followed, whenever possible, the same plan of attack that was adopted so successfully in 1745. The siege of 1758 was conducted with that scientific skill and precision which were necessarily wanting in 1745, but the scheme of attack against the King's and Dauphin's bastions was on the same basis as that of the first siege and led to similar results. It is on record that Wolfe's operations at Lighthouse Point and at Lorembec were in accord with the suggestions made in 1757 to the British government by one of the officers who took a prominent part in Pepperrell's expedition.[1]

The capture of Louisbourg was but the prelude to a series of events which gave Canada to England, and Louisiana for some years to Spain, and laid the foundations of the United States of America and of the Dominion of Canada. These events are inscribed in letters of gold on the pages which relate the triumphs of the administration of Pitt. Abercromby was beaten at Ticonderoga, and Lord Howe, described by a great statesman as "a character of ancient times and a complete model of military virtue,"[2] met an untimely, though a soldier's, death at Lake George. On the other hand, Forbes drove the French from the valley of the Ohio, and Bradstreet, whose services are mentioned in a previous page, won Frontenac and gave to the English the control of Lake Ontario. After the conquest of Cape Breton the English took possession of St. John's Island, and the greater part of its inhabitants were sent to France. Wolfe destroyed the French settlements on the bays of Gaspé, Miramichi and Chaleurs, and when he had completed

[1] Samuel Waldo to the Rt. Hon. W. Pitt. See Can. Archives for 1886 p. clii. For references to the authorities on the operations of 1758, see App. IX and X to this work.

[2] H. Grenville, "Correspondence," i. 262.

this unpleasant duty he could not refrain from writing to Amherst that they had "done a great deal of mischief, to spread the terror of his Majesty's arms through the gulf, but have added nothing to the reputation of them." Colonel Monckton destroyed the posts and scattered the French in the valley of the St. John river. Amherst himself hurried to Lake Champlain, on hearing the news of the disaster at Ticonderoga, and assumed the command which had been so unfortunately entrusted to Abercromby. In the following year he forced Montcalm to retire to Quebec, and here the latter met his death on the same battlefield where "died Wolfe victorious." It is a memorable fact in the history of Louisbourg, which may well be noted here, that within a year after the capture of the fortress another noble fleet and army assembled in the port and made preparations for the conquest of Canada. A fleet of twenty-two ships of the line and many frigates, under the orders of Admiral Saunders, and an army of nine thousand men, gave life once more to the harbour, which was still full of floating ice from the vast fields that had been passing down the gulf for weeks previously and barring the entrance to the eastern ports of the island. When the colonial contingents had arrived and all the necessary arrangements were completed, the last great fleet that has ever entered the harbour, once so famous in history, sailed for the St. Lawrence with much enthusiasm and a stern determination in every heart to plant "British colours on every French fort, post and garrison in America."[1] Quebec fell, and the English by their ever famous victory gave a new colonial empire to England. Levis, after the death of Montcalm, struggled to sustain the honour of his country, but his victory over Murray at St. Foy could not save Canada from her inevitable destiny, and in 1760 Montreal was surrendered to the English and Canada was lost to France for ever. A remnant of Acadian French that still lingered by the bays and rivers of the Gulf of St. Lawrence and by the St. John, caused some apprehension to the government of Nova Scotia after the fall of Louisbourg and the destruction of their settlements by Wolfe and Monckton, and it was found necessary to remove as many as possible to the vicinity of Halifax. Subsequently a number of these people were sent to Boston, but as the authorities of Massachusetts would not receive them, they were forced to return to Nova Scotia. Many of them went to the French islands of St. Pierre and Miquelon and engaged in the fisheries, but eventually they came back to Nova Scotia and New Brunswick, and, having consented to take the oath of allegiance to the English sovereign, settled down quietly in the country. So, after a century of uneasiness, and of misery towards the close, the old colonists of Acadie found a resting-place for themselves and families, and in these later times their descendants are a quiet, if not energetic, class, engaged in farming and fishing in the maritime provinces of Canada.

VIII. Cession of Cape Breton to England by the Treaty of Paris in 1763 and its History as an English Possession.

In 1763 the treaty of Paris[2] was signed and France ceded to England: "Canada with all its dependencies as well as the island of Cape Breton and all other islands and coasts in the Gulf and River Saint Lawrence and in general everything that depends on the said countries, islands and coasts with the sovereignty, property and possession, and all rights

[1] Knox, "Historical Journal of the Campaigns in North America (1757-1760)," i. 279.

[2] For text of this treaty so far as it affects Cape Breton see App. XVI to this work.

acquired by treaty or otherwise which the most christian king and the crown of France have had till now over the said countries." From that day to this Cape Breton has remained in the possession of England, and for many years after the remarkable event of 1758 the island was a forgotten spot in that vast colonial empire, which was won by Clive, Wolfe and Amherst in Asia and America. A few months after the capture of Louisbourg the British government gave orders to raze the fortifications with all the works and defences of the harbour so that none of the materials could be used for the same purpose at any future time. It was also ordered that the houses of the town should not be destroyed except so far as might be necessary for the full and complete execution of the orders for "totally destroying all and every the fortifications thereof," but "in the demolition of all the works" an eye was to be "particularly given to render as far as possible the port and harbour as incommodious and as near impracticable as may be." These orders were carried out during the summer of 1760 under the directions of General Whitmore who was then in command of Louisbourg, and with the assistance of a company of engineers who were sent for that purpose to Cape Breton.[1] In a few weeks the work of many years was destroyed and the fortifications were levelled to the ground. All the artillery, munitions of war, and stores of various sorts were taken to Halifax, and considerable quantities of fine tufa and Portland stone which formed the foundations and ornamental parts of the best buildings were carried to the same place where they were used in the new town which was slowly growing up on the slope of the hill overlooking the spacious harbour. The citadel, the stone building partly destroyed during the siege, was temporarily repaired for the accommodation of a few troops still kept at Louisbourg until further orders from the imperial government. With the destruction of this once famous town and the cession of Cape Breton to England, Louisbourg eventually passed away from the memory of the world, and half a century later an English minister of state during the war of 1812 actually ordered "all American prisoners to be removed to Louisbourg as a place of safety."[2]

The history of Cape Breton since 1763, when it was formally ceded to England, can be very briefly summed up. By a proclamation dated the 7th of October, 1763, King George the Third annexed this island and St. John's "with the lesser islands adjacent thereto to our government of Nova Scotia." The island was constituted one electoral division with the privilege of sending representatives to the assembly of the province. For years, however, no such representation was given to Cape Breton in consequence of there being no freeholders in the country entitled under the provincial law to elect mem-

[1] See Akins, "N. S. Archives," 476-478-486. Dr. Kingsford in his "History of Canada," (iv. 141, *n.*) tells us that "it was not until the 1st of June, 1760, that the uninterrupted destruction of the works was commenced under Captain Muckett, of the company of miners, assisted by working parties from the infantry, of strength varying according to the work, from 160 to 220 daily. The miners and artificers numbered a little over 100. The whole work was completed on the 10th of November, 1760, there having been only two days' intermission besides Sundays, one being the king's birthday and the other midsummer's day. The reason for keeping this latter day is thus mentioned in a M. S. diary of the mining operations at Louisbourg, now in the Royal Artillery office, which belonged to Sir John Seymour. According to tradition among the miners, Midsummer was the first that found out the copper mines in Cornwall, for which occasion they esteem this a holy day, and all the miners come from below ground to carouse and drink to the good old man's memory." See "Hist. of the Royal Regiment of Artillery" by Major Francis Duncan. R. A., pp. 203-204.

[2] See Haliburton, "Hist. of Nova Scotia," i. 293. This incident recalls the story told of the Duke of Newcastle, —"Good gracious you don't say so, Cape Breton is an island, I must run and tell the king." See Wright, "Life of Wolfe," 487.

bers. In 1765 the population of the whole island does not appear to have exceeded one thousand persons, chiefly of French extraction, living at Ile Madame, at St. Peter's, on the Bras d'Or Lake, and on the harbours and bays between Louisbourg and St. Peter's. The English garrison in the old town consisted of three hundred regular troops. At that time the town comprised one hundred and fifty buildings, of which sixteen were of stone and only twenty-five inhabited; but nearly all of them were in a ruinous state. The population of Cape Breton appears to have made no progress during the closing years of the last century, for in 1774 there were only ten hundred and eleven persons on the island, exclusive of the Micmacs about two hundred and thirty in all.[1] The English government commenced at an early date to make surveys of the lands, but as they did not, for many years, give grants, there was no encouragement whatever for settlement on the island, although its valuable resources were becoming gradually known through the reports of the soldiers and officers who were stationed there from time to time. A number of French Acadians returned from St. Pierre and Miquelon where they had gone in 1761, and a few loyalists came to Cape Breton during the war of independence and settled at Louisbourg, Cow Bay, Bedeque and on the Marguérite River. In 1783, when Lord Sydney—the Honourable Thomas Townsend—administered the affairs for the colonies, New Brunswick, St. John's and Cape Breton were formally separated from the government of Nova Scotia, and made distinct provinces A lieutenant-governor was appointed for Cape Breton and inasmuch as its "situation and circumstances" did not "admit the calling of an assembly," he could "until it appears proper to call such assembly in the meantime make such rules and regulations, by the advice of our council, for the said island as shall appear to be necessary for the peace, order and good government thereof"; but nothing could be passed or done "to affect the life, limb or the property of the subject, or to the imposing of any duties or taxes," and all rules and ordinances had to be transmitted at the first opportunity for the approval or disapproval of the king in council. The lieutenant-governor of Nova Scotia remained governor in chief over the new colonial governments, and had the right to hear appeals from any courts that might be established within his jurisdiction.[2] The first result of this new system was the foundation of the present capital of the island on the beautiful and spacious estuary, previously known as Spanish River or Harbour, and which was given the name of Sydney in honour of the statesman under whose auspices Cape Breton was separated from Nova Scotia. From that time until this Louisbourg has remained a hamlet of fishermen,—the safe refuge of cruisers in storms, and an object of curiosity to the few tourists who have found their way to that remote coast, once so famous in historic annals.

The political history of Cape Breton, as a distinct government, is not in any sense interesting or instructive. The first governor was Major Frederick Wallis DesBarres, an English officer who had served with distinction at the second siege of Louisbourg and was in attendance on Wolfe during the memorable engagement on the field of Abraham.[3]

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[1] Murdoch, "Hist. of Nova Scotia," ii. 529.

[2] See App. XVI (D.) at the end of this work for substance of royal instructions respecting Cape Breton as a separate government.

[3] Some American accounts of DesBarres' life state that he was aide-de-camp to General Wolfe at the siege of Quebec, and "that officer received his mortal wound while DesBarres was making a report to him and fell, dying, in the arms of his aide." (See "Appletons' Cyclopædia," also their "Dictionary of American Biography.") Captain Knox, a most trustworthy narrator, says in his "Historical Journal of the Campaign," (London, 1769.)

Subsequently he had been employed in surveying the coasts of Cape Breton and Nova Scotia, and was, so far as acquaintance with the island went, well qualified to be the first to administer its local affairs. Immediately after receiving his commission Lieutenant-Governor DesBarres proceeded to the island, and among his first official acts was the formation of a council.[1] A great seal was sent him to affix to all acts of state. Courts of justice were duly established, by ordinance of the 22nd of February, 1785, and the laws of England relating to the administration of justice declared to be in force in Cape Breton.[2] The appointment of DesBarres, however, was not in the end advantageous to the island and its public service in many respects. He was jealous of the superior authority of the governor of Nova Scotia, and also quarrelled with the military commandant at Sydney. His conduct was disapproved by the authorities in England and his drafts on the treasury for the payment of provisions which he had been obliged to purchase for the relief of the inhabitants at a critical time when the little colony was threatened with starvation were not even honoured, and he was obliged eventually to return to England where he remained for years endeavouring to obtain payment for his losses; but failing at last to receive that consideration to which he seems to have been, on the whole, fairly entitled, he returned

that many officers claimed the honour of being Wolfe's supporters after he was wounded, but he states on incontestable authority that Lieutenant Brown of the Grenadiers of Louisbourg, whom Wolfe was leading at the time he was fatally struck, Mr. Henderson, a volunteer in the same company and a private man "were the three persons who carried his excellency to the rear, which an artillery officer seeing, immediately flew to his assistance, and those were all that attended him in his dying moments. I do not recollect the artillery officer's name or it should be recorded here." Both Wright ("Life of Wolfe," 586, 587, *n.*) and Parkman ("Montcalm and Wolfe," ii. 296, 297, *n.*) consider Knox's report by far the best attested. Warburton, in the "Conquest of Canada," (ii. 349) states that Colonel Williamson of the Royal Artillery was the officer who went to Wolfe's aid. DesBarres himself, in an account of his services given in a work of his own (see App. XV), makes the following statement: "He (DesBarres) received the king's particular commands (signified by the late Earl of Chatham) to attend General Wolfe as an engineer on his expedition against Quebec..... In the field of battle on the 13th of September he was making his report to the general on orders he had just executed, when the regretted hero received his mortal wound." This statement would certainly show he was acting at the time, under special instructions from Wolfe. But it is remarkable his name does not occur in any account of this memorable scene. Bouchette, in his "British Dominions in North America," (i. 265, *n.*) makes a similar claim for Major Holland, a friend and relative of his own, well known as surveyor-general of Canada, who was "at the taking of Louisbourg, and subsequently at the reduction of Quebec in 1759, and stood near General Wolfe when that great hero fell on the Plains of Abraham." The gallant general, adds Bouchette, "as a testimony of his regard, presented Major, then Captain Holland, with his pistols and left him the greater part of his plate." These circumstances certainly did not happen on the battle field. As a matter of fact, Wolfe had willed his plate to Admiral Saunders (Wright, "Life of Wolfe," p. 574), and the presentation of the pistols is not mentioned by a single historian, nor does Holland's name appear in connection with the last scenes in the hero's life. Bouchette's assertion is probably mere hearsay and romance. Wright says with truth that "various persons, either from the vanity of talking or the more pardonable desire of being associated with Wolfe, have asserted that they carried him from the field or were present at his death." Appleton's "Cycl. of Am. Biog." repeats Bouchette's story of Holland being near Wolfe and adds he was mentioned in the will. He was the same Samuel Holland who made surveys of the coast of Cape Breton Island, published by DesBarres himself in 1781. (See "Nar. and Crit. Hist. of Am," v. 440, *n.*) Both Holland and DesBarres could not have been present at the closing scene. It looks as if Major Holland was mistaken for DesBarres by the writer in the "Am. Biog." It is certain that the mention of Holland in Wolfe's will is an entire delusion, and so is probably the rest of Bouchette's statement.

[1] For further particulars of the life of this remarkable man, see App. XV.

[2] In 1805, the island was divided into districts of separate jurisdiction, by an ordinance of the 3rd of June, which recited that the laws of England had been extended to that island by his Majesty, and provided that all subsequent acts of parliament relating to the administration of justice in the courts of king's bench and quarter sessions in England would extend to Cape Breton, so far as the same were in their nature applicable.

to Halifax where he died at the remarkable age of 103 years.[1] Of his successors in the government of the country until 1820 there is nothing of interest to say. Their administration of affairs was simply noted for squabbles of the most contemptible character with the members of their councils, some of whom seem certainly to have been remarkable for irritability of temper, probably fostered by the inconveniences and discomforts of life in a little village so far from the great haunts of men. Many of them no doubt,—

> "Mistook the rustic murmur of their burgh
> For the great wave that circles round the world;"

and in the spirit of a little bureaucracy believed themselves so many magnates. Governor, judge, secretary, attorney-general, and officials generally could not permit anything to come between the wind and their dignity. Even so accurate an historian of the island as Mr. Richard Brown, who lived the greater part of his life at North Sydney, engaged in the development and study of its mineral resources, dwells reluctantly on this period of its annals, and is obliged to admit, while referring to Lieutenant-Governor Ainslie,[2] that "like all his predecessors his reign was, from first to last, disgraced by continual quarrels and disputes, alike dishonourable to all the parties concerned." Finally a question arose as to the means of carrying on the government of the island. Amongst other laws, or as they are strictly termed, ordinances, passed by the lieutenant-governor and council, was one in the year 1801, for levying a tax of one shilling a gallon upon all spirituous liquors imported into the island during two years. This ordinance was afterwards questioned

[1] The following are the names of the first Councillors who were sworn in to assist and advise the lieutenant-governor: Richard Gibbons, chief justice, president; David Mathews, attorney-general; William Smith, military surgeon; Thomas Moncrieffe, fort adjutant; J. E. Boisseau, deputy commissary of musters; Rev. Benjamin Lovell, military chaplain; Thomas Uncle, William Brown and John Wilkinson; clerk of council and provincial secretary, David Cuyler. Subsequently on account of difficulties between DesBarres and the commandant of the garrison, Colonel Yorke, the fort adjutant and the chaplain resigned, and Alexander Haire and George Rogers were appointed in their place. The names of the other civil officers of the province, in addition to those just given in the list of councillors, were as follows: surveyor-general, Thomas Hurd; comptroller of customs, William Brown; naval officer, George Moore; postmaster, Thomas Uncle; Rev. Ranna Cossit was appointed in 1786 first rector of St. George's Church. He and all the officers of the civil government were paid out of an imperial grant made by parliament for that purpose. By an ordinance of the 14th of Feb. 1791, the whole island was constituted one parish, and the minister required to be of the Church of England, with some provision for liberty of dissent. (See Brown's Cape Breton for other information on this subject). The majority of the names here given have disappeared, but there are still in the island representatives of the Dodds, Cossits, Gibbons and Moores, who took part in the public affairs of the island when its government was first established. The Dodd family have given three judges in succession to the bench. Numerous descendants of the settlers that came into Cape Breton in its early days are found at Sydney, Louisbourg, St. Peter's, Ile Madame, Bedeque and other parts of the island. For instance, Lorway, Kavanagh, Townsend, Martell, Bagnall, Robertson, Tremain, Crawley, Ball, Ingraham, Hill, Plant, McKinnon, Clarke, Dumaresque, Brown, Weeks and Crowdy. But with the coming of the Scotch settlers, Macdonald, Ross, MacKinnon and other names of "that ilk" began to prevail from one end of the island to the other.

[2] The following is a list of the lieutenant-governors of Cape Breton while it had a government of its own:—Major Frederick Wallet DesBarres, 1784—1787; Lt.-Colonel Macarmick, 1787—1795; Attorney-General D. Mathews, president of council, administrator, May 27, 1795—June 29, 1798; Brigadier-General Ogilvie, president of council, administrator, June 29, 1798—June 21, 1799; Brigadier-General Murray, June 21, 1799—September 16, 1800; Major-General Despard, September 16, 1800—July 6, 1807; Brigadier-General Nepean, July 6, 1807—June 1, 1813; Brigadier-General Swayne, January 1, 1813—February 6, 1816; Lt.-Colonel Fitzherbert, February 5, 1816—November 4, 1816; Major-General Ainslie, November 4, 1816—June 22, 1820; Captain David Stewart, administrator, until 9th October, 1820, when Cape Breton was reunited to Nova Scotia.

as illegal on the ground that in consequence of the royal proclamation of 1763, and of the letters-patent and instructions[1] relating to the government of Cape Breton, no tax could be levied in the colony except by consent of its representatives convened in an assembly. On that ground, and after an exhibition of much public discontent, the payment of the tax was at length resisted, and an action brought in 1816 to recover it for the crown by the King's collector against Messrs. Leaver and Ritchie, then lessees of the coal mines. The cause came on for trial in the supreme court of the island in November, 1816, before Chief Justice Dodd, when a verdict was given for the defendant on the ground that the tax was illegal. To this verdict and the judgment given thereupon "the crown was advised to and did submit." This difficulty, involving important financial results, led to a radical change in the constitutional position of the island. Wearied with the squabbles of officials, finding that the island was making no progress under a government of its own, informed by the crown officers that there was no legal provision for raising a revenue in the island, and that some change was imperatively required in the general state of affairs, the English government took steps to reannex the island to the government of Nova Scotia and to declare it a distinct county of that province, "to be called and known by the name of the county of Cape Breton; and to be represented, and the civil government thereof to be administered, in like manner as the other counties of the province are administered and governed.[2] This action of the imperial government created much discontent among the officials of the island, and strong remonstrances against the union were sent to England, where they were supported by the famous agitator, David Hume, in the British parliament. The majority of the inhabitants of Cape Breton appear, however, to have been quite indifferent to the measure, and its unpopularity was mainly confined to the little capital. The constitutional point was raised by the petitioners that the island had never been formally annexed to the province of Nova Scotia after its cession by France as an integral part thereof, but that it had been for a short time placed under the government of the province, and had been subsequently given by letters-patent a distinct constitution, with a lieutenant-governor and council and the right to call an assembly when necessary, and that this constitution having been once solemnly granted by the crown could not be taken away, except by the consent of the people or by an act of the imperial parliament. The question having been referred to the judges of the privy council they decided that the inhabitants of Cape Breton were not by law "entitled to the constitution purported to be granted to them by the letters-patent of 1784, mentioned in the above petition."[3]

For many years the progress of the island was retarded by the supineness of the English government in giving titles to lands, none being granted even to actual settlers. Captain Holland's survey was completed in 1767, but still no move was made to open the large tracts of valuable land which were available for cultivation. Between 1770 and 1780, merchants from the island of Jersey began to establish fishing settlements on Ile Madame, Cheticamp and several places on the Gut of Canseau, some of which grew to considerable size. For some inexplicable reason, when free grants of land were offered to

[1] See App. XVI, (D,) to this work.

[2] See App. XVI, (E,) for proclamation reannexing Cape Breton to Nova Scotia.

[3] See Brown, Hist. of C. B., 458, 459, and App. XVI, (D,) to this work, where a reference is given to the petitioners' case.

the loyalists who came to Nova Scotia at the close of the war of independence, the governor of that province was not allowed "upon any pretence whatever to make any grants in the island of Cape Breton or any other island comprehended within his government without express orders to that purpose."[1] With the establishment of a separate government in Cape Breton, however, there was a decided improvement in this particular, and grants were freely made to immigrants. A great current of population began to flow into Cape Breton from the islands and northern parts of Scotland where the great landlords wished to rid their estates of their peasantry and turn them into pasture lands for the raising of cattle and sheep, just as in these later times they have driven off the humble crofters from lands which they wish to make preserves for deer. This Highland migration settled the counties of Pictou and Antigonish, in Nova Scotia, and then began to find its way to Cape Breton, at first to the western coast. From the close of the last century, when this population first came into the country, until the reunion with Nova Scotia when it began to cease, at least twenty-five thousand persons are estimated to have settled on the public lands, waste for so many years. Cape Breton from that time was no longer a French but a Scotch colony, whose old homes must be sought in the Hebrides, on the rocky, windy shores of far away Lewis or Stornoway, or in some rude sheiling by the side of a lonely loch or stream amid the mountains of northern Scotland.

For the greater part of this century Cape Breton has had but a sluggish existence. The Scotch population in the early days of settlement led quiet uneventful lives on that remote island of eastern North America. If sometimes their thoughts went back to the islands and mountains of their native land, it was to remember their poverty and wretchedness and the greed of the great lords under whom they lived, and to congratulate themselves on the complete freedom which they enjoyed on lands which were now their own, and which with industry and patience gave them at least a comfortable subsistence. The waters that surround the island, and the numerous streams which everywhere find their way to the sea abound in fish of all kinds, and it was easy for them to live in this new land compared with the one they had left. As the country grew older, as its means of communication increased—very slowly it must be admitted in this long neglected island—as its great coal mines were developed, the appearance of Cape Breton improved much for the better. Many of the children of the old settlers went to the American cities, and returning from time to time to their old homes, brought with them fresh ideas which have already made their influence felt, even in the remote Scotch and Acadian settlements. In the beginning of the present century there were only a little over two thousand persons, exclusive of a few hundred Indians, throughout the island, but at the present time the population is close to ninety thousand,[2] of whom between fifty and sixty thousand are the descendants of the immigrants from the islands and highlands of Scotland.

It was not until well into the present century that the rich mines of bituminous coal with which the island abounds, chiefly on the eastern coast, between little Bras d'Or and

[1] Brown, "Hist. of C. B.," 386.

[2] The Census returns of 1891 show as follows: Cape Breton, 34,223; Inverness, 25,781; Richmond, 14,400; Victoria, 12,390. As in other parts of Canada there has been an exodus of young men and women to the United States for the last forty years, and the increase of population from decade to decade is consequently not shown by the Census.

Cow Bay, became developed to any extent. They appear to have been known to the French even in the days of Sieur Denys, who was given the right to collect a small duty on coal and plaster within the island. While Louisbourg was occupied by the French, they brought fuel chiefly from the cliffs of Morienne, now Cow Bay, and also from the little Labrador as it was then called. The English from 1745 to 1749, when they occupied Louisbourg, used the coal chiefly at Burnt Head, near Lingan or Bridgeport,[1] and the Labrador. After 1758, when Cape Breton became a permanent possession of England, the mines at Cow Bay supplied the garrison and inhabitants of Louisbourg, and were for years protected by a fort and block house, of which a memorial remains in the name of the "Block House Mine." The coal deposits for seventy years were worked in a fitful and unsatisfactory manner, either by the government itself or by small contractors, and the yearly output did not average more than 4,000 chaldrons during that period. The British government did not at any time take an active interest in their operations, or encourage their development by commercial enterprise. A small tax or royalty was usually levied on each chaldron of coal mined by the contractor for the time being, and it was the opposition to the payment of taxes by Messrs. Leaver and Ritchie, who had the lease of the Sydney mines in 1816 that helped to show the English authorities the necessity of making a change in the government of the island in 1820.[2] Some years after the island was again united to Nova Scotia, the imperial government gave a monopoly for sixty years of the mines of the whole province to a spendthrift royal duke—the Duke of York—who deeded his rights to a famous firm of English jewellers, Rundell, Bridge and Rundell, who formed an English association in 1827, known as the General Mining Association. This company worked the mines of Sydney, Bridgeport and other places in Nova Scotia for thirty years, exclusively under their charter of monopoly. An agitation against their sole use of such valuable property eventually ended in an arrangement by which all the mines came into the possession of the government of the province, with the exception of those at Sydney, Pictou and other places where the association had long been working successfully.[3] As a consequence of this important change in the proprietorship of the mines of Cape Breton, there are now some ten collieries carrying on a large trade[4] in one of the richest sources of wealth which the island possesses.

The total output of coal from the mines of the island of Cape Breton has now reached about a million of tons, and the total export at about seven hundred thousand tons.[5] The

[1] See *infra*, sec. IX.

[2] See *supra*, two pages. Also Brown, "Hist. of Cape Breton," pp. 433-435.

[3] Mr. Gilpin, inspector of coal mines for the province of Nova Scotia, says with much truth that "the energy and wealth of this company were of great benefit to the province, and its conduct and that of its chief officers has ever been honourable, and calculated to set an example of honesty and reliability." The Association "has now disposed of all the coal lands owned by it in Nova Scotia proper and retains its selections in Cape Breton, operating chiefly in the historical Sydney main seam, which has been drawn upon by the miner for over one hundred years." See "Coal Mining in Nova Scotia," by E. Gilpin, M. Can. Soc. C. E., p. 5

[4] See App. XV. (last paragraph) to this work for a reference to "Geological Reports of Canada" and other books, showing the value of the coal deposits of Cape Breton.

[5] Mr. Gilpin, inspector of mines, in his annual report for 1890, gives the following statistics: Bridgeport raised 28,223 tons; Caledonia, 156,174; Franklyn, 723; Glace Bay, 111,472; Gowrie, 141,099; International, 143,091; Ontario, 9,049; Reserve, 155,906; Sydney, 181,571; Victoria, 90,930. The total sales were 916,994 tons, against 738,250 in 1888. The home sales were 223,732 tons, and those in the province of Quebec, 480,462 tons Until the imposition of a duty in 1867 on Nova Scotia coal coming into the United States ports, the greater proportion of this product found its way into the American market, but since the commencement of Confederation and the

coal mines of Cape Breton have so far monopolized what capital and enterprise have been directed to the island, but attention is now being gradually given to the other mineral and natural riches it possesses. The gypsum is of excellent quality, and found at Mabou, Bedeque and other places in large deposits. Copper is being mined in the neighbourhood of Sydney, and good indications of iron are traced both in Cape Breton and Inverness counties. The Marble Mountain at West Bay, one of the picturesque inlets of the Bras d'Or lake, has long attracted notice, but it is only now that an organized effort is being made to develop this remarkable illustration of nature's handiwork. The deposit is exceedingly extensive, and the marble is described as of the finest quality, "the white being pronounced by experts equal to the best Italian for statuary, while the colored and mottled varieties are very beautiful."[1] As a matter of fact, the actual extent and value of the mineral wealth of the island have hardly yet been fully investigated. Nova Scotia and British Columbia, as the two extremes of the Dominion, must sooner or later be among the largest contributors to the wealth of Canada; and it is safe to say that no section of the former province is so rich in mineral resources as the island of Cape Breton, whose magnificent water facilities give it a decided vantage-ground, so far as shipment of all heavy products like coal, copper, iron, gypsum and marble is concerned.[2] The trade returns of the two principal ports of Sydney and North Sydney, for the fiscal year ending on the 30th of June, 1890, showed that thirteen hundred foreign vessels, representing a total tonnage of 405,937 tons, largely made up of steamers, cleared and entered, against 448 vessels in 1797–98, with an aggregate tonnage of 19,770 tons. The fisheries of the island now employ between 100 and 150 vessels, upwards of 4,000 boats and over 10,000 men, with an annual catch valued at over a million and a half of dollars; but in this particular Cape Breton does not show as much enterprise and energy as some ports in western Nova Scotia, owing to a want of sufficient capital in this great branch of industry, for whose successful prosecution the island, by its geographical situation, is specially adapted. Once famous Louisbourg, which formerly employed in the fisheries about a hundred vessels and boats and a thousand men, with an annual catch estimated at sixty thousand quintals of cod, now only owns at most forty boats, employing about 120 men, while the value of all fish products does not exceed twenty thousand dollars.

In the course of time the island was divided into four electoral districts, named counties—the township system, which gave Sydney one representative for years, being eventually abolished. These counties are Cape Breton, which includes the old township of Sydney; Victoria, so called in honour of the sovereign; Richmond, in memory

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opening up of an extensive trade with the country on the St. Lawrence, the intercolonial trade has steadily increased, as the foregoing figures for Quebec show. Out of the total sales of the Nova Scotia mines in 1890, 1,519,684 tons, the United States took only 73,892 tons. Speaking generally the coals of Cape Breton are bituminous and coking; many of the seams yield large volumes of gas of good quality; for domestic purposes they are everywhere acceptable, as they kindle readily and leave little ash. For marine and railway steam-raising they compare favourably with any foreign competitor.

[1] Mr. E. Gilpin in his annual report on the Mines of Nova Scotia for 1890, p. 48.

[2] The eminent geologist, Sir William Dawson, in a recent debate on the Mines of Cape Breton (see Trans. of Can. Soc. of Min. Engineers, Montreal, 1888, p. 35) expressed the opinion that "mining was only beginning to be developed, and he had no doubt that the time would come when Nova Scotia and Cape Breton would become the England of the Dominion and great centres of population. Mining and minerals, unless a great change took place, would undoubtedly form the basis of the wealth of the Dominion, and determine the position of the great cities of the future."

of one of the governors-general of Canada; Inverness, in memory of old Scotia. These districts are represented in the parliament of the Dominion by five members, and in the assembly of Nova Scotia by eight members. For many years of its history the island was governed for certain local purposes by the old English system of quarter sessions, composed of a grand jury and justices of the peace, who imposed the assessment and devoted its proceeds to the public needs; but this unsatisfactory and feeble system has at last given place to municipal self-government based on that of the large and enterprising province of Ontario. Still, despite this move in a right direction, the legislature of the province attempts at times to be a great municipal council for the whole province in many particulars; for instance, in the construction of roads and bridges. This system, as it is worked out by political managers, is susceptible of much political jobbery and wasteful expenditure of the public moneys.

In 1829 an historian[1] wrote of the schools of Cape Breton, "there are none worthy of the name, not even for the acquirement of mere elemental knowledge, except one or two at Sydney and Arichat, and these are chiefly maintained in questionable existence by individual exertion." For nearly thirty years and more the same remarks applied to the educational condition of the island, and it was not until 1865 that the legislature of Nova Scotia at last awoke from its indifference on the subject and adopted a school system which, with the various amendments made subsequently in the original laws, has brought about a great change for the better. Illiteracy was the rule in Cape Breton as in other sections of Nova Scotia until this new school law, largely based on that of the great and prosperous province of Upper Canada, now Ontario, was extended over the province from one end to the other.[2] Under existing conditions nearly all the children are brought in Cape Breton within the reach of educational influences of some kind. In each of the counties there is an academy, open to all young people who are able to pass the prescribed examinations. In Sydney this institution has attained a high state of efficiency, and is housed in a large and convenient building in remarkable contrast with the school accommodation in the town a quarter of a century ago and less. In addition to these academies there are twenty-five graded schools in the island, a few of which are of a high order, particularly that at North Sydney. The number of common school sections throughout Cape Breton in 1890 was 469, but of these 29 were without teachers—not a creditable statement to make of communities in these days. The 477 teachers employed during the summer term of 1890 in the island are classified as follows:—

Grade A. (Academic and Graded Schools)	8
" B. (First Class)	62
" C. (Second ")	153
" D. (Third ")	254

The third or inferior class of teachers still bears an undue proportion to the total number in each county, as the following statement shows:—

Cape Breton Co.	69	out of	161	in all.
Richmond	37	" "	74	" "
Inverness	98	" "	169	" "
Victoria	50	" "	73	" "

[1] Haliburton, "Hist. of N. S.," ii. 249.

[2] Rev. Dr. Smith, of Sydney, has given me the facts on this subject.

The school teachers, as a class, are very poorly paid in this island compared with those in the western province of Ontario. The highest salary paid in the superior grades is $370 (in Cape Breton county) and the lowest $193, but there is relatively little disparity between male and female teachers. The women's salaries in the higher schools range from $318 to $193 a year, and the men's from $370 to $258. In the lower grade of schools the salaries range for men from $212 to $122, and for women from $231 to $116—those of the latter being on the average in these classes higher than those of the men.[1] The teachers in the academies, graded schools and larger sections are regarded as very competent; but in many of the smaller rural parts they are very inferior, and this is a fact easily explained by the very low salaries that are offered. In some places there is said to be a curious battle going on between the Gaelic teacher and his English pupils who find more amusement than profit from their instruction in a hybrid tongue. Nepotism prevails in Cape Breton, as it does elsewhere in official circles, and the rural trustee finds it very convenient to foist off a poor relation on his district. In all the country sections, school matters are administered by a board of three trustees, but in the incorporated towns the municipal council appoint three of their number to act on a school board, and the government select two other persons on the nomination of course of the local political manager —a fact showing the tenacity with which Nova Scotian politicians cling to patronage, however humble. All the people, irrespective of sects, contribute to the support of the public schools, and a separate school system has practically no recognition in Nova Scotia. In the larger towns there are convents for the education of girls, but these are supported by the voluntary contributions of the Roman Catholics, and have no connection with the public schools of the island. The academies and schools generally are supported by provincial grants and by local taxes. On the whole, the people of Cape Breton have a system of schools which fairly well represents their material and intellectual development. As the island increases in wealth and the people feel more ambitious impulses, education in the rural sections will become of a higher order, and the teacher in his salary and qualifications will illustrate the intelligence and enterprise of the community where he pursues his laborious and responsible occupation.

It is interesting to the people of Cape Breton to learn that at an early period of their history an intelligent English officer wished to give their island a higher position in the government of British America. Colonel Morse, of the Royal Engineers, in 1784, made a tour of Nova Scotia under the orders of Sir Guy Carleton, commander-in-chief of his majesty's forces in North America, and stated in his "Observations" on the defences and security of the province that he was "strongly impressed with the idea of uniting these provinces [Nova Scotia and New Brunswick] with Canada, to the advantage of both countries, and that by establishing the same laws, inducing a constant intercourse and mutual interest, a great country may yet be raised up in America,, to facilitate which it may be found proper to establish a seat of general government and protection," and for this end it occurred to him that "the island of Cape Breton is very favourably situated." It is a

[1] One gentleman to whom I am indebted for information on this point says that "miserably small as the salaries of the lower class teachers are (especially in Inverness where they are nearly three-fifths of the whole) they are, so far as the contribution of the section goes, in some few cases, I believe paid in the way of board, the teachers being passed along from one house to the other." This shows the primitive state of things in certain parts of Cape Breton.

"promontory standing, as it were, between the three provinces, and happily situated for communication with the several parts of all the three, besides being the most safe and easy land for ships to make coming from Europe."[1]

IX. Some Picturesque Features of Cape Breton and Memorials of the French Régime.

Leaving the subject of the varied resources of Cape Breton to the statist, let us now turn to the picturesque aspect of the island, and to the memorials which still remain of that old *régime*, whose history has been briefly written in these pages. From summer to summer for many years the writer has visited this island endeared to him by the associations and memories of his boyhood, and always interesting for the fresh beauties revealed on its grand coast, its beautiful rivers and its spacious bays, and for the opportunity it gives of drawing the visitor from the prosaic present, with its cares and selfishness, to the contemplation of other days when men and heroes fought and struggled for the supremacy of two great nations on its storm-beaten shores. We find, still lingering on the bays and harbours, the old names which existed in the middle of last century, when M. Pichon, that discontented Frenchman visited the same places, and left us a description of their natural features which in some respects is as true of these days as of his own time. Ile Madame, Baleine and St. Esprit, are still familiar names of the French rule. But Micmac, Portuguese, Spaniard, and Frenchman have in their turn left memorials of their presence indelibly imprinted on the bays, rivers and headlands of this ancient island,—ancient confessedly in American geography. The manner or the time of their baptism is now buried in obscurity or absolute darkness, as I showed in the commencement of this paper, and in many cases it is impossible to tell their exact meaning, and especially is this true of the Indian or Micmac words.

Standing on one of the bleak hills which overlook the Strait between Nova Scotia and Cape Breton we recall its history since the days the Sieur de Fronsac was struggling against the jealousies of rival traders and attempting to establish a seigneurie for himself in its vicinity. His name, which for a while was given to this arm of the sea, long ago disappeared from the memory of all except the historic student, and the old title, whatever its meaning, clings persistently to these picturesque shores. From time to time the graceful fishing vessels of New England glide over its waters, with their white canvas and trim hulls, the envy and admiration of all sailors—so amazingly in contrast with the clumsy hulks of the Basque vessels of St. Jean de Luz which, three centuries ago and more, frequented these coasts.[2] The derivation of the name is now a matter of conjecture. In the old maps and charts it is spelt Campseau or Canseau, and the present method is an English corruption of the original name. One writer will have that it is derived from the Spanish Ganso, and has reference to the great flocks of wild geese which fly over the Strait at certain periods of the year, and which naturally attracted

[1] See "Can. Archives," (1884) liii, for full text of these "Observations."

[2] L'Escarbot writes ("Hist. de la Nouvelle France," ii. 576) of an old Basque captain of St. Jean de Luz, one Savalet, who had frequented the eastern ports of Nova Scotia for 42 years before the author saw him in 1605, and whose name was given by the early French voyageurs to a little harbour a short distance from Canseau, probably Whitehaven. See Abbé Laverdière in a note on this latter point in his edition of Champlain's works, ii. 277.

the attention of the early Spanish navigators;[1] but this appears to be a mere ingenious effort of the same fancy which has given a Spanish origin to Canada,—*aça nada*—instead of the generally accepted Iroquois deriviation, "kannata" or collection of cabins. It has also been urged that a French sailor by the name of Canse first gave his name to the Strait, but this theory has been easily disposed of by the fact that the author who is mentioned as the authority for this supposition was actually writing of the West Indies, and referred to one Cause.[2] As a matter of fact the name fisrt appears at the port of Canseau, on the southeast coast of Nova Scotia—a great resort of Breton and Basque fishermen from early times, and was subsequently extended to the arm of the sea between the peninsula of Nova Scotia and Cape Breton. L'Escarbot is no doubt correct in stating that it is an Indian word; and indeed on reference to the best work on the Micmac tongue we find that it still exists in the old form of *kamsok* which means "a steep bluff rising on the opposite side." The Indians, in accord with their custom of naming places from certain natural characteristics, probably so called the Strait from the steep bluffs on the Nova Scotia side —one of which, Cape Porcupine, is especially conspicuous from its curious resemblance to the back of the little animal from which it is named. The French who frequented the port of Canseau at a very early date must have given it the Indian name applied to the whole Strait.

St. Peter's—the French Port Toulouse—is the first place of importance after leaving the Nova Scotia side of the Strait where we find ourselves on historic ground in Cape Breton. This well-known place, which still retains its importance as a geographical and commercial point, appears to have been named after the Count de Toulouse, who was an illegitimate son of Louis Quatorze and Madame Montespan, and won high distinction as a naval commander. The establishment formed at St. Peter's by Denys was situated, as far as can be ascertained, on a rocky neck of land in a little cove to the right of the entrance of the canal; and in this same neighbourhood, from the days of the French, there has been always a small settlement of fishermen and traders. The new village which has grown up since the construction of the canal can be seen to the left of the canal and is a collection of painted or whitewashed wooden houses, almost bare of trees. In old times when Pichon wrote of this locality, it was a centre of communication for the whole island, and the most important post after Louisbourg. Here one "could observe the least motion of the English at Canso or in the passage of Fronsac, and advice could be sent to the commandant of Louisbourg in less than eighteen hours." In 1755 there were in this place two hundred and thirty inhabitants exclusive of officers and troops, and the people who were very industrious found constant employment in building boats and vessels, in the cutting of timber, and in the fisheries. The name of Port Toulouse has passed away since 1758 and the older name of St. Peter's, which existed in the time of Denys, has been restored, if indeed it ever disappeared from the vocabulary of the people or of the sailors who frequented this port. It is claimed that the name was originally Portuguese, and there is some authority for this claim in the fact that we find in the old maps a cape San Pedro in the vicinity of an arm of the sea between the *terra des Bretones* and Cap de Breton. One learned archæologist is inclined to believe that it was at St. Peter's, and not at Inganiche that the Portuguese made their first and only settle-

[1] Judge Haliburton, ("Sam Slick") in his "Hist. of Nova Scotia," ii. 223, *n.*

[2] See Abbé Laverdière's note in his edition of Champlain's works, ii. 279, *n.*

ment in the Gulf, and goes so far as to make them the builders of a fort the ruins of which can still be traced about one hundred yards to the westward of the canal;[1] but here we enter into the realm of mere speculation and have really no facts before us except the general knowledge that this was certainly a favourite resort of the early French, and was probably visited by the Portuguese as early as, if not before, the Basques. We have to be content with the information given us by Champlain, who had the best means of knowing something of the subject, that Inganiche was the scene of the abortive attempt of the Portuguese to establish a settlement in Cape Breton, and we should probably be grateful to the learned antiquarian who favours the claim of St Peter's that in his zeal for the Portuguese he does not tax our ingenuity too far, but allows the Micmacs to retain the possession of the word Inganis or Inganiche—undoubtedly of Indian origin. But leaving these interesting imaginings of the Old Mortalities of the countries on the Gulf,—and it is amazingly easy to build up theories of the past on the slight evidence that remains to us of the occupation of the island before the French—we come to the remarkable mediterranean sea known in these times as the Bras d'Or lake. Here we can sail or steam for many hours on the bosom of an arm of the sea ever widening, ever lessening, with the highlands of the north always visible, and the lowlands of the south receding as we find ourselves on one of its great expansions. Anon we pass through a narrow gorge or channel cut by some convulsion of nature, or more probably worn by the action of the waves since primeval times, and pass from one lake to another. From northeast to southwest, in the course of untold centuries since the world was young, the ocean steadily forced its way through the rocky hills of the interior of the island and formed a series of lakes, bays and channels affording safe and uninterrupted navigation for ships of large size for at least fifty miles from Point Aconi, the most easterly head of Boularderie island, to the narrow isthmus which long barred progress to the Gut of Canso, but which, too, must in some distant future have yielded to the never ceasing action of the sea. Here at last the enterprise of man has come to the aid of these inland waters, and given them access to St. Peter's Bay by means of the fine canal already mentioned. The lake divides Cape Breton into two sections, each distinguished by diverse natural features The northern division is remarkable for its lofty mountains and cliffs, which end at last in Capes Lawrence and North. The southern division has none of the ruggedness and grandeur of the country on the other side of the lake, but here we find the most spacious harbours—of which Sydney and Louisbourg are the best—and the richest coal areas of the island. From Port Hawkesbury to the Strait of Canso as far as Cape St. Lawrence, there are no good harbours on the picturesque western coast compared with those on the southern and eastern shores of the other division. Between the eastern entrances of the Bras d'Or and the storm-swept

[1] Rev. Dr. Patterson in Trans. of Roy. Soc. of Can. vol. viii, 2 sec. Another Nova Scotian writer, R. G. Haliburton, in 'Popular Science Monthly' for May, 1885, p. 48, is also inclined to believe in a Portuguese colony at St. Peter's. "Traditions" he writes, "as to an early settlement still linger among the Micmacs, who aver that certain earth-mounds at St. Peter's, Cape Breton, were built by white men before the arrival of the French. This belief received many years ago a confirmation by the discovery in one of these mounds of an archaic cannon formed of bars of iron fastened with iron bands or hoops, those toward the breech being the strongest. This gun attracted little attention at the time and was broken up. My knowledge of this circumstance is derived from the historian of that province [his father Judge Haliburton] who, for more than twenty years was on circuit in Cape Breton once, if not twice, a year. * * * An inquiry into the date of the manufacture of such guns showed clearly that it must have been brought out before the arrival of the French in Cape Breton. Were these remains at St. Peter's vestiges of this early Portuguese colony?" See *infra*, sec. X, similar cannon at Louisbourg.

promontory of Cape North, there is the fine harbour of St. Anne's, which at one time was nearly chosen the capital of Cape Breton, then Ile Royale, and is in its natural aspect more interesting than Louisbourg on account of the sublime vistas of forest-clad hills and of the great ocean far beyond. The Bras d'Or lake is connected at the east with the Gulf by means of two guts or straits known as the great and the little Bras d'Or entrances —one running to the north and the other to the south of the fine island of Boularderie which is a long narrow tract of land now inhabited chiefly by Scotch settlers, and which was also called in French times the Ile de Verderonne, until it came to be better known by the name of its first proprietor, a French gentleman who served with distinction in the French navy and at Port Royal in Acadie.[1] At several points on the lake from St. Peter's to Sydney, there are many features of interest to attract the tourist. The picturesque narrows which connect the two lakes, is now crossed by a graceful drawbridge of iron, over which the railway passes from the Strait of Canso to the capital town of Cape Breton. At this point you catch many charming glimpses of the expansive lake and the dim hills which stretch far to the north and west. Baddeck, strictly speaking Bedek,[2] an old Micmac name changed by the French to Bedeque, is a charming little harbour where a summer retreat has been made on the slopes and plateaus of the hills which rise from the water's edge. Here Charles Dudley Warner dipped his pen to describe its charms in his humorous vein, and now science finds its representative in the inventor of the telephone who has raised his laboratory in this sylvan retreat, and finds the rest he needs by cruising in the devious channels and bays of these beauteous inland waters. The sail from this pretty spot through the entrance of the great Bras d'Or offers many a charming vista of cliffs where the gypsum[3] mingles its white with the dark green of the overhanging spruce, and where the land rises into lofty hills, with their slopes dotted by cottages on little patches of meadow. Churches, with tapering steeples, all of an unfailing type, square, commodious and ugly, testify to the religious fervour of the inhabitants who

[1] The first Frenchman who obtained a grant to settle and develope the fine island at the entrance of the Bras d'Or Lake was Louis Simon de St. Aubin de Poupet, Chevalier de la Boularderie, who had been *enseigne de vaisseau* in the French navy, and distinguished himself as commander of a company in the successful defence of Port Royal in 1707 against the New Englanders under Colonel Wainwright. He appears to have been connected with a commercial company for the settlement of the islands of Inganiche and Verderonne (now Boularderie) and the lands in the vicinity of the little entrance to the Bras d'Or. He died in October, 1738, and was replaced by his son who was also in the French navy. The latter was appointed commandant of Inganiche or Port d'Orleans in 1741. His establishment at Labrador was burned in 1747 by the French "in order to annoy the English in obedience to the orders of M. de La Galissoniere," the English being then in possession of the island. Why it was necessary to burn a Frenchman's buildings to annoy the English, the summary given in the Canadian Archives of the French document relating to this affair, does not state, but it appears the French at that locality were submissive to English allegiance, and assisted in supplying the English garrison at Louisbourg with coal. It seems Boularderie and his family were reduced to poverty and applied to the French government for relief, when Louisbourg came again into possession of the French. He was given assistance, and was probably the same person who was captured by the English on the day of the landing at Gabarus Bay in 1745, and afterwards released by Governor Shirley on his arrival in Boston. He was appointed in 1746 a Captain in the French army in Canada. See Murdoch, "Hist. of Nova Scotia, i. 293-360. "Can. Archives," (1887), ccxciv, ccci, ccciii-ccciv, cccvi, cccxv, cccxxiv-v, cccxxix, cccxxxii, cccxxxiv, cccxlvi-vii, cccxlvii, "Quebec Doc.," iii. 241-374-592.

[2] Dr. Rand ("Micmac Dict.") gives the correct name as ebĕdĕk.

[3] In the marine limestone formation of the island "the gypsum is met rising like a ruined marble palace of Eastern climes from the waters of the Bras d'Or, or frowning in a cliff hollowed into a thousand little caves and recesses by the waves and ice. In the woods, from a distance, it recalls the tented homes of an army, or broods like a dismantled castle over some quiet valley." See E. Gilpin's paper on the Minerals of the Carboniferous (N. S. Inst. of Nat. Sc., 1889.)

live by the side of this interesting lake. At vespers, we hear the peal of the bells coming over the water, and finding an echo in the dark receding hills. Sometimes this sheet of water takes a fancy of running deviously into the recesses of the hills and of forming bays and basins, where the land rises precipitously from the water's edge, and only at intervals offers places sufficiently level for the farmer to make his little clearing. Many places on the lakes bear uncouth Micmac names—Whycocomagh, for instance—but still there are not a few memorials of the old French days. One romantic basin, where the entrance is barred by ragged islets, and the shores are indented by numerous little coves, receives the waters of a stream which forces its way from the northwestern country where we meet with a Sky Glen, a Mull, a Glen Dhu, Strath Lorn, Glencoe and Brigend, to remind us of the origin of the people who now live among the Cape Breton hills. But this basin and river still bear the name of Denys,—in honour of the old seigneur of Cape Breton, who during his residence at St. Peter's constructed a road to connect his post with the Labrador. It was his practice to haul his boats over this road.

No one who visits the Bras d'Or lake but will readily confess that it is appropriately called the Golden Arm, not merely on account of its picturesque features but equally for the natural wealth that exists in its waters, its excellent farm lands, its plaster quarries, and for the other riches that still lie buried in its mountain ranges. This poetic name, however, appears to be quite of recent origin. All the old French and English charts of the island give to the lake the name of Labrador. It is true the English and French versions of Pichon's descriptive sketch, in one place, speak of the Golden Arm,—probably the origin of the new name — but in every other part of the work he uses the old title.[1] In Denys's map of 1672 and in that of the Sieur de Bellin in 1744, we find "Labrador"—the latter adding "*appelée par les sauvages Bideauboch.*" It is still called by the Micmacs Petoobook, which is the correct spelling of a word which the French reproduced as nearly as possible from the sound. In all probability it is the same name given by the Portuguese navigators to the sterile country, to the east of Canada, which they were the first of Europeans to discover. How it came also to be applied to this inland sea of Cape Breton, we have no conclusive evidence to guide us. It is generally believed that the name was first given to the coast of the continent because Cortereal took away with him a number of Indians who were described as well fitted for slaves. No such incident is connected with the history of Cape Breton. If it were possible to believe that the name Brador or Bradour is an Indian name meaning a deep and narrow bay which, like the fiords of Scandinavia, stretches into the interior of a country, then the difficulty would be solved, but there is no authority for this statement which is made by a writer whose theories on such subjects have not generally stood the test of accurate inquiry.[2] Bradore Bay on the Labrador coast is considered to be of French origin — simply the Breton mode of pronouncing *Bras d'eau;* and if we are to accept this as a fact then it is easy to suppose that the French who settled on this Cape Breton sea gave it the name which describes its natural characteristics. It is a curious fact, which is worth mentioning in this connection that a French privateer commanded by a M. de Brotz, which was captured by Captain Tyng before the first siege of Louisbourg, while cruising in search of colonial vessels, was not only

[1] In his description of the island of Cape Breton he always speaks of the Labrador. See App. VII, (5) to this work. Jefferys' Atlas (1778) has also "Labrador."

[2] M. Jules Marcou, cited by Ganong in 'Trans. of Roy. Soc. of Can.,' VII., sec. 2, p. 52.

built on the lake, but actually called after it, Labrador, — another proof of the general acceptance of the name. It is just possible that among the early settlers in this part of the island there were some French settlers from Bradore bay on the bleak northeastern coast of the Gulf and that in this way the name was first given to this beautiful lake which, in later times, so impressed its visitors that they changed it to the more poetic appellation which it now bears with general approval.

If Bras d'Or is but a modern phrase, it is not the only example we have of the tendency to give a French version to names, the original meaning of which has been lost in the lapse of centuries. We see this illustrated in the name of the little bay of Mainadieu, to the westward of the dangerous isle of Scatari, to which was also sometimes given the name of Little Cape Breton. To the southeast of this bay is that cape from which the large island itself has in the course of years been called. Nearly all the French maps describe it as Menadou—and Charlevoix gives us for a variation Panadou—in all probability an Indian name like Pictou[1] in Nova Scotia or Mabou in Cape Breton, or Cibou,[2] which was the Micmac name of either St. Anne's or Sydney harbour, if not of both. It was obviously easy to coin Mainadieu out of the old Indian word, so akin to it in sound, and to suppose that it was once given by some storm-tossed sailor who believed that he saw the hand of God stretched forth to guide him into this little haven of refuge on the rough Cape Breton coast. Nigh by are two little harbours on whose encircling hills fishermen have dwelt from the earliest days of which we have any records, and whose names appear frequently in the accounts of the two sieges of Louisbourg, especially in that of 1758, since it was at one of these ports that Wolfe established a depot for the support of his batteries on Lighthouse Point. Some years ago a woman of the neighbourhood, while passing a little hillock, accidentally discovered a small jar which had been hidden for a century and a quarter or more, until the rains and snows had worn away the earth and brought it to light. As she lifted it carelessly a little stream of gold coin poured forth—louis d'or from the mint of the days of Louis Quinze, whose head was imprinted on the metal. In all probability, in a hurried flight to Louisbourg, when the English came on the coast in 1758, the treasure was buried and never reclaimed by the owner who met his death behind the walls of the old town. The place where these coins were found is now known as Little Loran in distinction from Great or Big Loran, the port nearest to Louisbourg, where Wolfe made his post. Some contend that the name is only a corruption of Lorraine, but nowhere in any writing or map is there authority for such an hypothesis. Billan, Pichon and others give us Lorembec, which naturally recalls Malpec, Kennebec, Cascumpec, Norembeque or Norembec, and other Indian names of old times of Acadie and the countries on the Gulf of St. Lawrence. In the Micmac tongue *bek* or *bec* is a familiar termination to the names of places, and one or two French writers have called this

[1] Sir W. Dawson is authority for the statement (Trans. of Can. Soc. of Min. Eng., 1878, Montreal, p. 35) "that the name Pictou originated with the old Micmacs because of the gaseous emanations which were continually taking place on the outcrops of the coal seams."

[2] Grand Cibou is the old Micmac name generally given to St. Anne's (Brown's History, 77), but it appears from the narrative of Mr. Charles Leigh, who visited Cape Breton in 1597, he entered a harbour called by the natives "Cibou," which, from his description, is clearly Sydney. (See Hakluyt, Goldsmid's ed., xiii. 69.) It is quite obvious that the early voyagers found the Micmac name of river, seeboo, applied indifferently to such fine harbours as St. Anne and Sydney. We meet with the same name on the western coast of Acadie, in the beautiful river of Sissibou. (See *infra*, third page, note.) Brown does not appear to have studied the Indian names.

harbour Laurentbec. In L'Escarbot's map we find St. Loran given to a cape at the north of Cape Breton, but this was done to give a place to probably one of Cartier's names, Cape Lorraine.[1] We may assume that Laurentbec was simply an attempt to gallicise an unknown Indian name whose sound to the ear naturally recalled the familiar title of the great gulf and river of Canada. Loran[2] is only a corruption of the stately name of Lorraine, which was given it for years, when no one, after the occupation by the English, could interpret the original word Lorembec, and there was a general tendency to fall back on the French *régime* in such matters of perplexity. In all likelihood we see in the strange and hitherto meaningless Lorembec a survival of an Algonquin word, which was applied in some remote time of which we have no accurate knowledge to the ill-defined region which was known as Norumbega or Norumbec, and even Arambec—though the latter was generally given to Nova Scotia—and was believed by some mariners and geographers of ancient days to extend from Florida even to the eastern shores of Cape Breton. The old French voyagers may have found the word on the coast of Cape Breton, and have given it to the places where it lingered long until it became at last Loran. Thus we may see in these obscure harbours of eastern Cape Breton a link to connect us with the past of northeastern America—the land of shadows and mysteries, where the city of Norumbega rose with palaces as substantial as those chateaux en Espagne of which all of us dream in the buoyancy and enthusiasm of hopeful and early manhood.[3]

The following verses on the Indian names of places in Acadie and Cape Breton, written in a melodious rhythm by a Nova Scotian poet,[4] will interest my readers in connection with the subject to which we are now referring.

"The memory of the Red man
How can it pass away,
While their names of music linger
On each mount, and stream, and bay?
While Musquodoboit's waters
Roll sparkling to the main;
While falls the laughing sunbeam
On Chegogin's fields of grain.

"While Escasoni's fountains
Pour down their crystal tide;
While Inganish's mountains
Lift high their forms of pride;
Or while on Mabou's river
The boatman plies his oar,
Or the billows burst in thunder
On Chickāben's rock-girt shore.

[1] See App. VII to this work.

[2] It is worth noting that at the mouth of the great Orinocco River there is an island named Loran. Perhaps some may trace a connection between these names of Loran in North and South America and the voyages of the early European voyagers to this continent.

[3] See App. IV to this work, where this interesting subject is still further discussed. Professor Eben N. Horsford, of Cambridge, Mass.,—the enthusiastic exponent of the theory that the ruins of mysterious Norumbega underlie Watertown, in the basin of the Charles near Boston,—traces in the ancient word a dialectic equivalent of an old Norse form of Norway which has survived on the lips of the eastern Indian tribes. Certainly even those who differ from him must arise from the perusal of his elaborate essays, so rich in valuable maps and illustrations, with the feeling, "Si non é vero é ben trovato." "See "The Defences of Norumbega," pp. 20-25.

[4] Mr. Lighthall in "Songs of the Great Dominion" (London, 1889), like some others, attributes this frequently quoted poem to the late Professor De Mille, a Nova Scotian, author of "The Dodge Club Abroad" in 'Harper's Monthly,' "The Cryptogram," and several other works of light literature. I had often heard it was written by a Mr. Richard Huntington, who was a journalist for a time at Sydney, C. B., and afterwards removed to Yarmouth, N. S., where he followed his profession, and published the verses in question. The Rev. J. R. Campbell, in his "History of Yarmouth" (St. John, N. B., 1876) mentions this fact.

"While floats our country's banner
O'er Chebuctou's glorious wave;
And the frowning hills of Scatarie
The trembling surges brave.
While breezy Aspotogon
Lifts high its summit blue,
And sparkles on its winding way
The gentle Sissibou.

"The memory of the Red Man
It lingers like a spell
On many a storm-swept headland
On many a leafy dell;
Where Tusket's thousand islets
Like emeralds stud the deep;
Where Blomidon, a sentry
His endless watch doth keep.

"It dwells round Catalone's blue lake,
'Mid leafy forests hid —
Round fair Discousse and the rushing tides
Of the turbid Pisiquid.
And it lends Chebogue, a touching grace,
To thy softly flowing river,
As we sadly think of the gentle race
That has passed away forever."

The poet has certainly used much poetic license in the closing words of his charming verses, for the records of history show that the Micmacs, during the wars between France and England on this continent, were far from being the "gentle race" here described. Indeed we have already read in a previous part of this monograph that they were considered among the most cruel and relentless of all the Indian nations. So far, too, from it being true that they have "passed away forever" the fact is that while they do not increase they are still numerous[1] in the island of Cape Breton, where they live on reserves by the side of the Bras d'Or, near the most picturesque parts of that beautiful sea. At Escasoni, prettily situated on the north side of the east arm of the lake — one of the poetic names given in the verses before us — the Indians own a fine reserve. On Chapel Island, once called St. Villemai, at the entrance of St. Peter's Inlet, they have a good chapel; and here the whole tribe assembles every summer for two weeks to celebrate the feast of St. Ann, and to attend the annual religious mission. They cultivate patches of land, and live in small cabins, but a few of them are still nomadic in their habits and periodically visit the towns and villages, near which they remain for a week in their birch-bark wigwams, making various wooden ware for which they obtain a ready market. But as a rule the Indians of the island are more steady and industrious than those of Nova Scotia proper.[2] Some of them still remember the stories that have come down from their ancestors of the French *régime*, and it was not long since the present writer copied

[1] By the Census of 1881 there were 250 Micmacs in Cape Breton County; 100 in Inverness; 90 in Victoria; 110 in Richmond, or 550 in the Island.

[2] In the report of the Indian department for 1890 (Can. Sess. P., No. 12), there is the following favourable account of the Indians of Cape Breton:

"In the northern counties, notably in those of Cape Breton Island, they are more enterprising and thrifty than their brethern in the southern counties, where the tendency to roam about the country keeps them from becoming domestic in their habits, and improving their lands. The Indians of the southern counties are also more prone to the intemperate use of intoxicants, as the temptations to which they are exposed in their wandering life are greater than those the Indians of Cape Breton have to encounter. The principal sources from which the former (Nova Scotia Indians) derive their subsistence are coopering, basket-making, and the other manufactures in which Indians are especially skilled. On the other hand, the Indians of Cape Breton devote themselves for the most part to the cultivation of the soil, and to employments which necessitate their remaining more at home; and the superiority of the one mode of life over the other is proven by the far more comfortable circumstances in which the latter Indians are found than the former."

the following testimonial of the fidelity of a well known Micmac chief of old times from an ancient document which his descendant was in the habit of taking on board the French men-of-war from the Newfoundland coast when they anchored at Sydney—as is their practice every summer—for the purpose of stimulating the generosity of the officers and men.

Jean Louis Comte de Raymond, Chevalier, Seigneur d'Oyé, La Tour, ey autres lieux, Maréchal des Camps et armées du Roi, Lieutenant pour sa Majesté des villes et du château d'Angoulême, Gouverneur et Commandant des Isles Royales Saint Jean et autres.

Sur les bons témoignages qui nous ont été rendues de la fidélité et attachement aux Français du nommé Jannot Pequidoualouet et de son zêle pour la religion et le service du roi nous l'avons nommé et établi; et par ses presentes, nommons et établissons chef des sauvages de l'île Royale.

En foi de quoi nous avons signé ces presentes et y avons fait apposer le cachet de nos armes et contresigné par l'un de nos Sécretaires.

Fait à Louisbourg le 17 Sbre, 1751.

(Seal) Le Comte de Raymond,
Pour Monsieur le Comte,
(Signé) Pichon.

John Louis Count de Raymond, Chevalier, Lord of Oyé, La Tour and other places, Field Marshal of the King's army, Lieutenant for his Majesty of the towns and castle of Angoulême, Governor and Commander of Ile Royale, St. John and other islands.

On account of the many evidences of fidelity and attachment to the French given by Jannot Pequidoualouet, as well as of his zeal for the religion and service of the king, we have nominated and appointed, and do hereby nominate and appoint him by these presents, Chief of the savages of Isle Royale.

In proof of which we have signed these Presents, and have appended thereto the seal of our arms, and the countersign of one of our Secretaries.

Done at Louisbourg, 17th Sept., 1751.

Count de Raymond,
Countersigned by
Pichon.

Scatari, Mabou, Discousse, Inganiche and Escasoni are, doubtless, Micmac names which have come to us through the French vocabulary, more or less changed in form and sound.[1] Scatarie or rather Scatari, as given in Bellin's and other French maps, is a

[1] I have only mentioned in the text those names in the poem which belong to Cape Breton. The other names, I may more appropriately explain here, still cling to the same places in Nova Scotia. Musquodoboit is a fine river, flowing southeast into the Atlantic ocean, in the county of Halifax. Its meaning I have not been able to learn. A famous Nova Scotia statesman and poet, Hon. Joseph Howe, spent "two of the happiest years" of his life—to quote his own words—upon the headwaters of this river, where he "learned to plough, to mow, to reap, to cradle," while he rested his brains wearied with the fierce contests of old times of responsible government. (See Howe's "Speeches and Letters," i. 513.) Chegogin is a village on a river of the same name, eight miles from Yarmouth, and is the corrupted form of the Indian Isegôgin or place for weirs. (Campbell, "History of Yarmouth," p. 4.) Chebuctou, or Chebouctou, is Halifax harbour, and means in Micmac the chief or biggest harbour or bay—che-bookt. Aspotogon is the name of a remarkable mountain on the southern coast of Nova Scotia, in Lunenburg county, fifty miles west from Halifax. I cannot give its meaning. The Sissibou is the old name of an extensive and beautiful river on the western side of St. Mary's Bay, in western Nova Scotia, and signifies "big river (cibou), an appellation which was given to it, on account of its discharging the largest body of fresh water of any river in that part of the province." (Haliburton ii. 170.) Chicaben appears to have disappeared from Nova Scotia geography, but Mr. Flint, M. P. for Yarmouth, informs me that it is the Indian name for a flower or plant which once flourished at Church Point, Clare township, Co. of Digby. Many years ago it was proposed to revive this old name of Church Point, but the proposition fell through and the Indian word is now almost forgotten. Tusket is the name of a river, a village and a cluster of rocky islets in southwestern Nova Scotia. Blomidon, which would always be remarkable for its grand beauty if it had not been made famous by the great American poet, is probably a foreign word, some say Portuguese. (See Dr. Patterson, Trans. Roy. Soc. Can., viii, sec. 2, pp. 153, 154.) It was called by the French in early times Cape Battiste. (Dr. Patterson, Trans. Roy. Soc. Can., viii, 2 sec., 153, 154.) Pisiquid is an old Indian name which Dr. Rand gives as Pesegitk, meaning "to flow splitwise as the tide passes up near Windsor and divides off into the St. Croix." Chebogue, called by some Indians (Campbell, "History of Yarmouth," p. 3). Itebogue, or spring water, and by others Tecebogue, or cold water, is a well known village and river near Yarmouth, N.S.

triangular island, off the most eastern coast of Cape Breton, and one of the most dangerous parts of the continent until the present lighthouse was erected. It is doubtful if it is Indian — it is probably a corrupted European name since, like Cape Breton, and Porto Novo, an island in the vicinity, it must have been first seen and named by the Basques, Bretons or Portuguese who visited these waters so many centuries ago. Scatari was also called Ponchartrain on some French maps, but it was never so known for any length of time. Inganiche is believed by some persons to be a Portuguese word, but even so earnest a supporter of the claims of that people to early discovery as Dr. Patterson admits that it is Micmac, although the meaning is now lost. Mabou is a small harbour on the western coast of Cape Breton, at the mouth of a river, of the same river which flows through a beautiful and fertile valley, whose fine meadow lands, rich with grasses, and shaded by noble elms and maples, afford a charming contrast with the rugged hills that stretch from the picturesque bay of Whycocomagh to the waters of the Gulf. Discousse is a fishing village in Ile Madame, nearly opposite St. Peter's Bay, and called Decoux by Pichon. Catalone or Catalogne is a reference to the picturesque lake, situated in the hilly country between Mira and Louisbourg, and only separated from the great Mira Bay by a narrow sandbar. The correct spelling is really Catalogne, which, some contend, is clearly the French version of the Spanish Cataluna or the ancient province of Catalonia in Spain, of which the mountainous features might in some respects be compared to this section of Cape Breton. It is claimed that both Catalogne Lake and Mira Bay, which are only separated from each other by a mere sandbar, have been named by the Portuguese and Spanish sailors that anchored frequently, centuries ago, in the bay. On the other hand, it is a fact all important in the discussion of this point, that in several documents relating to Louisbourg, still among the Paris Archives, there are references to a M. de Catalogne, who was an officer of the garrison from 1728 to 1735. A M'lle de Catalogne, either his daughter or sister, was married to a M. de Gannes in 1730, who was sent to New York in 1738 to purchase flour for the use of the inhabitants of the town. M. de Catalogne died about 1735, for there is an allusion in one of the official papers to some difficulties that occurred in that year, respecting the disposition of his property.[1] It is probable then that Lake Catalogne received its name from this officer, though the archives so far accessible give us no evidence that he had property in the vicinity. Mirè,[2] as the bay is invariably spelt in French documents, it may be added, would be naturally the French adaptation of Mira, the origin of which was probably unknown to the French of Louisbourg.[3]

The origin and meaning of Gabarus—the name of the Bay so famous in the history of the two sieges of Louisbourg—have perplexed inquirers. In all the French writers it

[1] "Can. Archives," 1887, cccv, cccvii, cccxviii.

[2] It is an interesting fact that in the "Ulloas' Voyage to South America" we read of a village of Mira near Quito, Chili, where the savants made some astronomical observations. A small river of the same name is also situated to the N. W. of the village in question. See Ulloa, i. 239.

[3] Since the remarks in the text were in type, I have seen an entry in the Index to the Quebec "Collection de Manuscrits," etc., which would intimate that a French officer, de Miré, may have given his name to the bay and river in Cape Breton. Two references are given of "de Miré" (iii. 284, 385) but one of them refers only to the bay, and the other to a M. de Miry (not Miré), a lieutenant ordered in 1746 to make a descent on the New England frontier. I cannot, however, find there was ever an officer of the name of Miré, or Miray (as the bay is generally spelt in French maps) at Louisbourg. As in the case of Gabarus, however, it is just possible we may have an easy solution of the whole question in the existence of a French officer or merchant who lived for a while in Cape Breton.

has its present name, but in most of the English accounts of the sieges of 1745 and 1758 it appears as Chapeau Rouge. Some may think that there is a connection between the two names; that Chapeau Rouge was given by the English colonists in 1745, as through an error for Gabarus, these respective names sounding much the same in ordinary conversation. Dr. Parkman throws doubt on the identity of the names, but does not help us to solve the problem. It is noteworthy, however, that the name Chapeau Rouge was not uncommon in the French nomenclature of New France. It is still found in Placentia Bay, on the southeastern coast of Newfoundland, directly across from Gabarus in Cape Breton. During the French occupation of Plaisance, Chapeau Rouge was a post of some importance and is frequently mentioned in the records of the time. It has been assumed by some persons with whom I have discussed the question that Chapeau Rouge may have been given to the Cape Breton bay by the settlers from Plaisance and its vicinity in remembrance of their former home in Newfoundland; but there is no evidence whatever to support this mere surmise. In Bellin's map of 1744 Gabarus assumes the still more mysterious form of Gabori. As a matter of fact the bay appears to have been named at an early period of its history after one Cabarrus, a Frenchman of Bayonne, who was the first to visit its waters though I have not been able to find the exact date. This much, however, I have learned on excellent authority. The family of Cabarrus—or Gabarrus as it was sometimes called—had been for a long time engaged in trade at Bayonne, and for a number of years in the fisheries of Acadie and New France. They had an establishment in the bay which now bears their name.[1]

It is curious to note how in the course of time, under the English occupation, the French names of places have assumed different forms, though retaining more or less the original vocal sounds of the old words. We see this strikingly exemplified in the present name of Lingan which has been given for very many years to a shallow bay which is one of the several harbours and bays that indent the coast of Cape Breton between Louisbourg and Sydney. On all the French maps it is marked L'Indiane or L'Indienne. Pichon informs us that this was a remarkable bay on account of the English having erected in 1745 a fort at a place called Cape Coal for the purpose of supplying the Louisbourg garrison with fuel. The French after they resumed the occupation of the fortress made use of the coal in the same mine and the intendant frequently gave leave to his favourites to load their ships from the pit instead of taking ballast. The mine, however, caught fire in the summer of 1752, and the fort was burned to the ground. Another name which has been considerably or almost entirely changed in its vocalisation is that of Arichat, an old and once prosperous town, famous for its large fishing establishments, situated on Ile Madame—or Maurepas from a well known French statesman—an island on the southeastern coast of Cape Breton where a large number of descendants of the old Acadians and French still follow their occupations as sailors, fishermen and farmers. The name "Madame" given for nearly two centuries to this well-known island, the prin-

[1] I am indebted for this information to M. Alph. Pinart of the Société de Géographie à Paris. In a catalogue of the well known bookseller, Dufossé of Paris, appears the following entry which corroborates the statement in the text:

"Cabarrus (Dominique de) Lettres de noblesse accordées au Sieur Dominique de Cabarrus, négociant à Bayonne, données à Versailles au mois d'avril, 1789. Copie contresignée par d'Hozier de Serigny, 4pp. in fol. Cachet du Cabinet d'Hozier.

Extr: 'C'est le frère du Sieur Dominique de Cabarrus qui a donné son nom à la baye Cabarrus à l'isle royale.'

cipal home of the Acadian French in Cape Breton, provokes inquiry. Madame was the title usually given to the eldest daughter of a French king or of a dauphin, or to the wife of the king's brother. I have not been able to find the exact date, when, and consequently the particular princess for whom, it was named. It must have been so called when Louisbourg, Toulouse, Orleans, and other places received royal titles in honour of the new importance that Cape Breton attained after the treaty of Utrecht. The old Indian name was Nericka, but its origin is obscure. Rand gives the present Micmac name as Neliksaak which is probably the original form.[1] Many places on the coast have entirely changed the names that appear in Bellin's and other French maps. Morienne Bay, for instance, a large sheet of water adjoining Mira Bay, on whose banks the French opened a coal mine in 1720, has assumed the humble title of Cow Bay from some insignificant incident or other in the life of the early English settlers. The aristocratic name Port Dauphin has long since been forgotten in that of the saint who has been so favoured in the French nomenclature of the province of Quebec. The names of de Rouville, de Costabelle, de Beaucourt and de Soubras, which were given during the French *régime* in honour of well known officers and officials at Louisbourg to certain places around the noble bay have been replaced by the names that attest the presence of the sturdy Gaelic people who till the mountain slopes or toil on the sea that is visible from every point of the picturesque country that surrounds that once famous bay. Point Dauphin, however, still clings to the southern head of the bay in memory of French times. Port of Orleans, however, is long since forgotten, and no one except the historical student will remember that it was intended to replace the old Indian name of Niganis or Inganiche.

As I write of Inganiche, amid the rocks of the stern northern coast of Cape Breton, I recall the interest that was taken many years ago in a bell that was brought to Sydney from the old port, where it had been discovered on the site of the chapel of the French settlement. It had a remarkably clear tone and must have been often heard for a considerable distance over sea and land when the wind was favourable. It had been baptized in orthodox fashion as the following inscription showed :—

> " Pour la Paroisse de Inganiche jay été nommée Jean Françoisse par Johannis Decarette et par Françoisse Vrail, Parain et Maraine—la fosse Hvet de St. Malo m'a fait. An. 1729."[2]

This interesting relic may have found its way to New England, where the most of such relics have gone, but its fate I have forgotten. How often in days gone by the sailors of some passing ship, on its way to the St. Lawrence, must have heard with joy the peal of this bell as it was borne over the water from the headlands of Inganiche to remind them of their home across the seas.

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[1] Probably the evolution of Arichat from Nericka came about in the same way as Anticosti was developed from the original Indian names of Naticousta or Natiscotic, which was corrupted in one of Champlain's maps to Antiscoty, and eventually to Anticosti. This would seem to be so from the fact that in French maps of 1750 and 1779 the harbour is called Nérichac and Nérichat; the transformation to Arichat is easy. As to Anticosti, see Ganong on the "Cartography of the St. Lawrence," 'Trans. Roy. Soc. Can.,' vii, sec. 2, art. 2, App. I.

[2] M. Faucher de Saint Maurice, in "Sept. Jours dans les Provinces Maritimes," states that in 1886 the barque Moselle wintered at Charlottetown. Her watch bell wore the date of 1674 and the following inscription: Franco Nicolas Sol de Salvador Lorenzo. On each side there was a cross. In 1878 this bell was found among the ruins of Louisbourg by the captain of the barque. No doubt it belonged to a vessel from the Spanish islands that traded with Louisbourg.

"Bell of the past, whose now forgotten music
Once filled the wide expanse,
Tinging the sober twilight of the present
With colour of romance.

I hear you call and see the sun descending
On rocks and waves and sand,
As down the coast the mission voices blending,
Girdle the heathen land.

O solemn bell! whose consecrated masses
Recall the faith of old—
Oh tinkling bell! that lulled with twilight music
The spiritual fold.

Your voice now breaks—now falters in the darkness,
Breaks, falters, and is still,
And, valued and mystic, like the host descending,
The sun sinks from the hill."[1]

Other places between Canseau and Gabarus Bay have retained their old French names without change. Fourché or Forked Bay, Framboise or Raspberry Cove, L'Ardoise or the Bay of Slate, and Petit Degrat, a famous "fishing place," in old times were all named for certain natural characteristics to which Pichon in his Memoirs of Cape Breton refers in detail. Flint Island, off Cow Bay (Morienne) is only the translation of Ile à pierre à fusil, as it is called on Bellin's and other French maps in allusion to the hardness of its rock.

On the northeastern coast of the island, to the south of Cape North, is a crescent shaped bay, with a fine beach of glittering sand barring the entrances of the barachois so common in this vicinity. It bears on the maps the name of Aspy Bay, but in Bellin's and other French maps of last century it was called either Havre Daspé or d'Achepé. Pichon refers to it by its present name, and tells us that the country around it was not inhabited and "hardly at all frequented." Its name is another of those questions which give an opportunity for much speculation. Some may claim that it is a memorial of Basque sailors who named the hilly country—perhaps the mountainous cape of Cape North itself, which forms the northern boundary of the bay—from some fancied resemblance to the Pic d'Aspé, among the Pyrenees, in a country well known to the people of the Basque districts of Spain and France. Others may claim that the other name D'Achepé, given by Bellin, is a Micmac term; perhaps it is the Apégé, the name given by L'Escarbot for the codfish.[2] The harsh Indian name might easily be softened in the course of time to Aspé by the French, just as Gaspé is believed to represent a contraction of the Abenaki word, Katsepi8i, meaning a separation from the other land[3]—a reference to the great rock which was severed from the cape in the course of centuries, and was long conspicuous above the waters, until at last it was worn away by the action of the ever restless ocean, and finally hoisted from its place and hurled amid the waves.[4]

X. The French Acadians,—their Condition and Prospects.

But it is not only in the name of some headland or river or bay that we find memorials of the old French *régime* on Cape Breton. Though Louisbourg is a grassy mound and St. Anne, Toulouse and Inganiche are no longer known by their royal titles, still, on the

[1] Slightly changed from Bret Harte's "Bells of the Angelus."

[2] See App. V to this work.

[3] See a note to Abbé Laverdière's edition of Champlain's works, vol. i, p. 68. The Abbé J. A. Maurault is given as the authority for this version of the name given to Le Forillon, the rock in question. L'Escarbot calls it "Gachepe," (i. 270) following Champlain. For other meanings of the word see Ganong's article in 'Trans. Roy. Soc. Can., vol. vii (1889), sec. 2, art. on Cartography to Champlain, p. 53.

[4] See Faucher de Saint Maurice, "De Tribord à Babord" (Montreal, 1877), 399–402.

storm-swept coast, in many a landlocked harbour and sequestered bay, or by the side of some lonely river linger a large and thriving body of the people who once owned Acadie and Ile Royale. War and its miseries, the animosity of the English government, the trials and privations of a pioneer life and all the difficulties of a rigorous climate combined for years to drive the French Acadians from Cape Breton and leave it entirely to the English settlers, but despite all the unfavourable circumstances that have surrounded them they continue to increase in numbers and have attained a considerable degree of prosperity. In the days when peace reigned and the people were able to follow their industry and commerce with some vigour, the total population of Ile Royale was estimated at between three and four thousand souls, men, women and children,—the greater proportion of whom lived at Louisbourg. When the fortress fell, the garrison and the French and the people of the island for the most part were removed to France there still remained on Ile Madame, on the Bras d'Or, on the northwestern coast, and in some remote parts of the island a few people who were left undisturbed in their humble settlements, probably forgotten or, if remembered at all, not considered dangerous to English dominion on the island. It is impossible to give the exact figures, but it is estimated by competent authorities on the subject that at the time of the deportation of the French from Louisbourg at least 700 were left undisturbed in other parts of the island.[1] Here they lived uneventful lives, for years, "the world forgetting; by the world forgot." It does not appear that the Acadian people of Nova Scotia before or after their cruel expatriation in 1755 ever gave any large accessions to the inhabitants of the island. The French government could not induce any number of them to come to Cape Breton, as it may be seen by the complaints from time to time of the officials in the island.[2] The population of Louisbourg was almost entirely composed of people from old France, and the only Acadians were a few persons employed for the most part as servants in families. The Acadians were found chiefly on the northwestern coast and in some sequestered spot by the Bras d'Or. Of the remnant of French population that remained in Cape Breton after 1758, however, the Acadians formed a large proportion, so far as I can judge from the meagre facts available. For some years after 1758 this little population remained without any additions to their number worth mentioning. In 1766 a considerable number of Acadians who had gone to the French islands of St. Pierre and Miquelon a year or two before became dissatisfied with the dreary prospect in those barren spots, and settled principally on Ile Madame and by the little Bras d'Or. The total number of this immigration however did not reach 400 souls—300, in fact, is the number generally given. In 1775 a few Acadian families—14 or 15 in all—came over from the mainland of Nova Scotia and settled in the vicinity of Cheticamp on the rugged northwestern coast of the island. Already there were some French families at Port Hood, which was formerly known as Just-au-Corps, where the quarrying of stone for building was still carried on as in former times of French occupation. Driblets of population flowed in from year to year from Nova Scotia and Prince Edward Island where the English government appear always to have

[1] See App. XIV at end of this work, where statistical details of the development of the Acadian population in Cape Breton since 1758 are given, with references to works on the subject.

[2] See "Can. Archives" for 1887, cclxxxvi. It appears that the British government after their occupation of Acadie refused to permit the Acadian French to remove to Cape Breton and "strengthen our enemies when occasion serves." See Akins, 'Nova Scotia Archives,' 6-9, 41, etc.

encouraged the expatriation of the French when the island became an English possession. So slow, however, was the progress of this class that in 1801 it is said that the total population of Ile Madame and of the northwest shore—exclusively French then—did not reach 1700 souls.[1] This count, however, does not include probably all the little settlements on the Bras d'Or or on the Marguérite river, where a population was gradually attracted by the good lands and the fine salmon fishery. No doubt for the first decade of the present century a few families came over to the Ile Madame and the northwest country, but at no time from 1758 to 1810 was there any noteworthy migration to any part of the island except what I have already mentioned. It is safe to say that the fourteen thousand or more French Acadians who now inhabit the island of Cape Breton are the descendants of the 700 old French and Acadians who remained in 1758 and of the one hundred families or so—certainly not more than one hundred families all told—that came into the island from 1758 to 1810. Always a prolific race, like the French Canadians, they increased largely, and their numbers would now probably be much greater were it not that in the course of time their young men and women sought occupation in the New England states—the former as sailors and the latter as servants or operatives in the mills. Still despite the drain on this population—probably less than in the case of Scotch and English inhabitants of some parts of the island—they show a slight increase from decade to decade in the two counties of Richmond and Inverness where they have been most numerous since the days of French occupation. I am informed by the authorities I have consulted in different parts of the island,[2] where the French Acadians still live, that in the county of Cape Breton, where Louisbourg is situated and the only district retaining the old French name, they are a very insignificant and apparently decreasing remnant. Louisbourg is deserted by its old possessors, and it is only in the pretty sequestered settlement of French Vale, at the head of a creek emptying into one of the branches of Sydney harbour, and in the charming country, through which the arm known as the little Bras d'Or connects the ocean with the great lake of that name, that we now find the descendants of the families who first made their homes in those picturesque and fertile districts many years ago. French Vale was settled by four brothers from Prince Edward Island in the beginning of this century, and the little Bras d'Or chiefly by Acadian emigrants from St. Pierre and Miquelon. With these came a number of old French people who left France at the time of the French revolution and had none of the characteristics of the Acadian French. Some years ago a few families came from the river Bourgeois in the county of Richmond and joined their countrymen on the Little Bras d'Or. French Vale at one time was a flourishing agricultural settlement, and its Acadian population lived happy, contented lives, but soon the younger people became discontented and while the young men sought employment in the coal mines, the girls went to the United States. The result is that the lands once tilled by the French Acadians are now for the greater part in the hands of Gaelic-speaking people. The Acadians are in Cape Breton undergoing that transformation which must be expected in the case of a very small number of people situ-

[1] See Brown ("Hist. of C. B.," 421,) which cites the statement of population sent to the English authorities by General Despard, while lieutenant-governor.

[2] I must here express my thanks especially to the Reverend Fathers Quinanof Sydney and of Arichat for the information they have given me respecting the French Acadians of Cape Breton and Richmond counties.

ated in the midst of a race speaking an alien tongue. The minority must sooner or later from the necessity of things speak the language and follow the customs of the majority. English is now the prevalent tongue everywhere, save in a few Acadian families where a patois of English and French is still spoken. Even the old French names are disappearing, and LeBlanc is now known as White, Le Jeune is Young, and Roy is King. All of them, however, appear to cling with tenacity to their old faith, though, as a venerable and well beloved priest of Cape Breton writes me significantly, "in a few years there will not be a trace of French about them but their ill-pronounced and imperfectly understood prayers."

It is in the southern and western counties of Richmond and Inverness that we find the largest, most prosperous and best examples of the French Acadian race, for we may leave out of the account altogether the few families that still claim a French descent on the northern and eastern shores of the now purely Scotch county of Victoria, where on the hills of Ports Dauphin, and Orleans once floated the lilies of France. Ile Madame and the adjacent coast of Cape Breton, were always from the earliest times of historical record a favourite home of the French. Its many bays, harbours and inlets, are well sheltered from the tumult of ocean and the storms that rage so often on the coast, and are relatively free from the dangers and inconvenience of the great masses of ice that come down the gulf between Cape North and Cape Ray in the springtime, and often choke up the eastern and southeastern ports and bays. Here the facilities for carrying on the fisheries, and engaging in the coasting trade have built up a large and industrious class of population.

It was on Ile Madame that enterprising merchants of Jersey[1] in the English channel, had for many years establishments for carrying on the fisheries. Nicholas Denys has had many successors since his time, and his countrymen have found a rich harvest in the waters that surround the island. Arichat was once the most important commercial town in the island, but nowadays it has sunk into relative insignificance with the disappearance of the old fishing-houses, and the growth of the outlying settlements. The adjoining village of West Arichat or Acadiaville, had already outstripped it in importance, when it too suffered from the fact that of late years the coal and coasting trade, for a long while a source of lucrative employment to the people, has been for the most part transferred from sailing vessels to steamers.

In the county of Richmond there are five Acadian parishes of importance; Arichat, West Arichat, or Acadiaville, and Descousse are on Ile Madame, and L'Ardoise and River Bourgeois on the mainland. A small settlement also exists on the west side of the basin of the River Inhabitants. Counting these parishes and other places of minor importance

[1] The old Jersey houses of Janvrin, DeCarteret, and Hubert that did a large business in the fisheries, giving constant employment to the Acadian French, have disappeared, and the only signs of their existence are dilapidated warehouses and worm-eaten wharves. The old house of P. C. Robin & Co., which was established over a century ago, may be regarded as the legitimate successor of Denys, since it does business still not only on Cape Breton, but in different parts of the Gulf of St. Lawrence. Their first establishment was erected in 1765, on Jersey Island, at the south entrance of Arichat harbour. They did business there for some years when their premises were burned by Paul Jones while cruising in the gulf, and destroying English property. Shortly after this occurrence they built on the south side of Arichat harbour where they still continue doing a large fish trade. One of the stores built in 1797 is still in a good state of preservation. I am indebted for the facts in this note to Mr. E. P. Flynn, formerly M. P., for Richmond.

there are probably eight thousand persons of French and French Acadian descent in Richmond. Descousse is now the most thriving settlement, and is outstripping Arichat and Acadiaville in essential respects, chiefly owing to the fact that the people own a fine fishing fleet which prosecutes the fisheries in the North Bay and elsewhere with enterprise and success. The shore fisheries, heretofore carried on in boats, have of late years become relatively insignificant, and this accounts for the prosperity of a place like Descousse which has shown enterprise in seeking fresh "sea pastures." Fishing and sailing are the chief occupations of the majority of the men though there are few families who do not own their little farms or plots of ground which they cultivate. Their villages are neatly whitewashed, and have generally a thrifty appearance. As a rule according to one who has long lived among them and from my own individual observation, they are plain and simple in their habits. In this corner of the continent, remote from the great centres of industry and activity, "they know little of the wants of the great world outside, and consequently are content to live on in their frugal, simple way, not desiring, because knowing nothing of the luxuries which are considered necessaries by the wealthy and even the well-to-do classes elsewhere." Their dress is still very plain in the small settlements and villages, though new fashions have begun to creep in among the young women, who visit the towns of the provinces or of the United States. In places like Arichat, where they live alongside the English-speaking people, there is little left by which they are distinguished in dress from the people of other nationalities. In many cases, elsewhere, they adhere to the primitive attire of their ancestors, the traditional Norman kirtle which has many attractions on a pretty young girl, with a well formed figure. In their domestic life they have retained a good deal of the original simplicity of the Acadian French of old times. French is, of course, essentially the language of the home. They go to bed early and are noted for their habits of early rising. "I may say," writes the reverend gentleman to whom I am indebted for much information on this subject, "that when going or returning from a sick call about day-break I can distinguish at a distance the Acadian houses by the smoke curling skyward while in all probability not a sign of life is visible in the homes of their English neighbours." While the men pursue their vocations as fishermen or sailors — in the coasting or foreign trade — the women contribute by their industry their full share to the support of their families. They plant and sow, tend cattle, shear the sheep, spin and weave. In many families nothing is worn which is not the product of their own looms. As in all other classes, there are shiftless and improvident persons among them, but "on the whole they may be said to belong to that middle, and let me say, happy class, which, without knowing want, have little to spare of this world's goods, but are nevertheless content with their lot." All of them, it is hardly necessary to add, have adhered loyally to the Roman Catholic church, and "rationalism" is a word unknown in their simple vocabulary.

Then we come to the adjacent county of Inverness which stretches from about the middle of Canso Strait to the heights that end with Cape St. Lawrence, and includes the westerly section of the great northern division of the island, so remarkable for its mountains, and rugged scenery. It is a county presenting few harbours of value compared with those in Richmond and Cape Breton.

Port Hawkesbury in the Strait of Canso has now become a more important place than

Arichat, and second only to the Sydneys as a port. The county, however, has fine stretches of meadow lands, and on the grassy slopes of its uplands and hills there are great facilities for grazing and the rearing of fine cattle. The Mabou and Margaree, (Marguérite) in their courses run through a beautiful country, which has not only a charm for the tourist "seeking fresh woods and pastures new," but shows to the practical eyes of the agriculturist that energy and good farming could here reap rich results. As I have already said it is on the fine farming lands of the Margaree that descendants of the French Acadians have had their homes for a century and more.

Between Margaree and Cheticamp there is a considerable population of the same class, while in the latter district we meet with probably the best types of the Acadians, with all their simple primitive ways, entirely free from the influences of the large Gaelic population that elsewhere, as in Cape Breton and Victoria counties, and even on the Margaree, has intermingled with the Acadians and changed their habits and methods of life in many respects. The total French Acadian population of the county is probably between four or five thousand souls, and the number is not likely to decrease for the same reason as in Richmond.

Indeed, the emigration of this people even from the rugged hills of Cheticamp appears rather on the decrease compared with what it was thirty years ago. Since then there has been a decided improvement in the condition of the people. While many of them cling to their primitive habits, they display much more enterprise and energy than their ancestors. As in Richmond the majority adhere to the French language, especially in the Cheticamp district, though wherever they are in the neighborhood of large English settlements they speak English with facility. Fishing and farming are the principal occupations of the people as heretofore, but as one well-informed person writes, "while thirty years ago not a single individual among them was engaged in trade, now they take a share in all the active pursuits of life, with energy, intelligence and enterprise, and are no longer the apparently subdued, timid people they were for many years after the possession of Cape Breton and Nova Scotia by England."

Inquiring into the intellectual position of this class in Cape Breton I find that they are in this respect considered somewhat inferior to other nationalities. Though it is shown they are displaying much more energy and activity in the various industrial occupations of life, yet they seem in the majority of places to lag behind the English-speaking members of the community from an educational point of view. One reverend gentleman to whom I am so much indebted for information of the condition of this people in Richmond, accounts for their educational deficiencies by the fact, that in forming the public school law of Nova Scotia, "the legislature gave little or no recognition to the existence of this important element of the population, and the consequence is that the young Acadian children have to acquire knowledge in the public schools through the agency of an unknown tongue." They must begin their elementary education, it seems, "by one of the most difficult of all tasks, the acquisition of an alien tongue, and then with an imperfect knowledge of that language they must proceed to acquire through its medium an acquaintance with all the branches which form a course of education in the public schools." In other words, English is the only recognized language of the public schools, and the Acadians are necessarily subject to a great disadvantage compared with the English

children who commence their education at the same time.[1] Of course the well-to-do people, of whom there are only a very insignificant number in Cape Breton, may send their children to special institutions where they can pursue their studies with every facility; but the reference here is entirely to the public schools, to which the French Acadians as a class can alone have access. The character of the French spoken by the Acadians depends, in a large measure, upon the locality and their surroundings. Where they are left to themselves they naturally speak better French, that is to say with less admixture of the English than where they are in constant intercourse with other nationalities who use Gaelic or English. They speak it "ungrammatically of course, but still it is pure French, and not a mere *patois*, though some of the words in use amongst them are now obsolete in France as well as in the province of Quebec." As a rule they have no knowledge of grammar, and *j'avons*, *j'allons*, *j'irons*, *je serons*, and the like are familiar expressions on all sides. Still they perfectly understand their language in its grammatical forms and phrases. One gentleman who has had a good deal of experience among them "has no hesitation in saying that the uneducated Acadian speaks French just as well as the uneducated French Canadian habitant." Where these people live among the English, as in the town of Arichat, they mix common English words with their ordinary conversation. For instance, I have heard an Acadian lady say in my hearing while on a visit to Arichat: "Quand j'étais à l'exposition à Halifax j'étais 'on the go' tout le temps, de sorte que quand je suis revenue j'étais complètement 'done out.'" The better classes have in Arichat and West Arichat or Acadiaville, convents managed by the Sœurs of the Congrégation de Notre-Dame whose mother-house is in Montreal.[2] The sisters in both these institutions are accomplished French, or French Canadian women, and the young Acadian girls have consequently an excellent opportunity of acquiring a correct knowledge of the language of their origin. A number of young Acadian women, graduates of these convents, teach in different school sections of the country, and are in a position to impart a fairly correct knowledge of their own language to their pupils. But it must be admitted that, though the Arichat convent was founded some thirty-five years ago, and that at West Arichat nine years later, little improvement can be noticed in the speaking of French, owing mainly to the fact that when the girls go back to their homes, after having gone through their course of studies, they return, in the majority of cases, to the ordinary phraseology or vocabulary of their youth. The boys, however, have no special educational

[1] I quote the remaining portion of the remarks of my correspondent on this subject as it opens up an important question. "Admitting, therefore, that our Acadian children occupy a position of inferiority in our public schools, it is just such a position as our English-speaking children would be forced into if the case were reversed. Let us suppose, by way of illustration, that no separate school system existed in the province of Quebec, that French was the only language recognised in its public schools, and that the children of the English-speaking minority could pursue their studies only through the medium of that language, what position would they occupy? How would they stand in relation to the French Canadians? Precisely, I would answer, as the Acadians now stand in Cape Breton. Yet this would be no proof, in my opinion, that the English children were really inferior from an intellectual point of view, but rather go to show the effect of an unjust system which would place the two nationalities in the schools on unequal terms. If then the Acadians are not always found up to the mark in the public schools, the fault lies not altogether with them but largely with our system of education, and I venture to say that could they but pursue their studies in their mother tongue, they would soon give a far better account of their mental capacity."

[2] See sec. III.

facilities like those afforded the girls alone by the Congrégation de Notre-Dame. Male teachers holding provincial school licenses, and at the same time capable of teaching French, are not to be had except in a very few cases. Many parents are not at all anxious, it is said on the highest authority, that their boys should be taught French in the schools, as they find that a knowledge of English is under existing circumstances much more useful to them. All these facts with respect to educational facilities and the use of the French language go to show in a measure that English must sooner or later obtain the mastery except in a few remote and isolated settlements.

Of course this question of two distinct languages in a community has its difficulties if one wishes to arrive at a solution fair to all nationalities, and the legislator may reasonably hesitate to give extraordinary facilities to the perpetuation of race distinctions. A small minority must always expect sooner or later to be absorbed into the majority, unless it is given and guaranteed special rights and privileges which enable it to have a longer existence. The question arises, whether it is wise in the case of a minority like the French Acadians of Cape Breton — about one-sixth probably of the total population — to surround them with special safeguards for the preservation of a language alien from that of the great majority, and in that way interpose a powerful obstacle to the formation of one people, speaking the same language. The strength of the English people, it may be argued, arises from the gradual blending of the Anglo-Saxon and Norman French elements of the population. It may be said — and indeed it has been said — that it would have been wiser had England after the cession of Canada by the treaty of Paris in 1763 looked forward to an amalgamation of the English and French nationalities in that country instead of giving the French Canadian special guarantees for the preservation of his peculiar institutions. In other words, it may be asked, if it is not the wisest policy for governments to place all nationalities on an equality in every respect, and to let nature and circumstances guide and mould their future. For my part, however, I am inclined to think that Great Britain in a measure atoned for the expatriation of the Acadians from Nova Scotia when she gave the French Canadians in later times the privileges they now enjoy. The French Canadians, as a result of the generous concessions of England, have become a powerful and distinct element of Canadian political, social and intellectual life and the time when they will blend with the English has been indefinitely postponed. Things, however, seem different in Cape Breton.

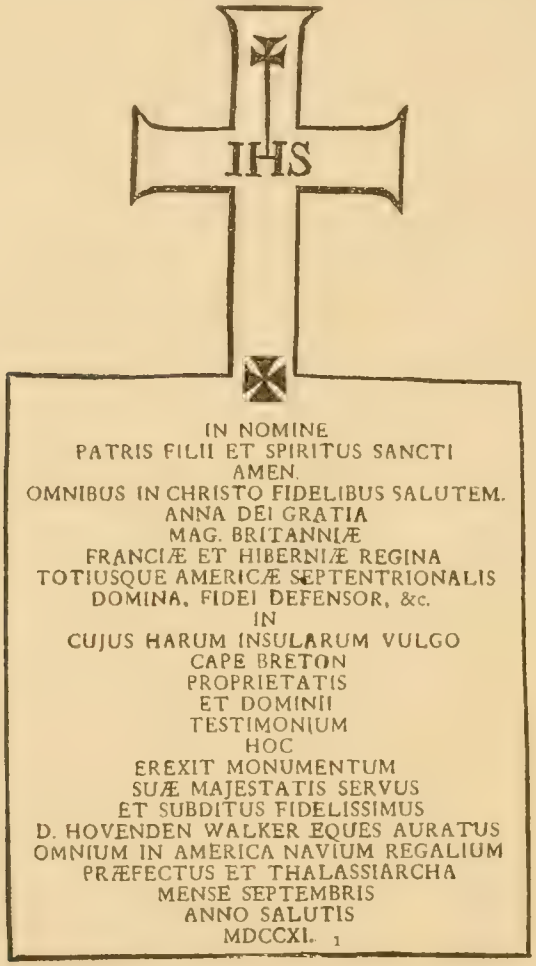
The Acadians where they are in a majority, as in Richmond, are likely to hold their own for very many years to come; but should a stream of English capital and population come into the island, their language and habits as a distinct race must gradually disappear whenever they become a small minority — as is the case now practically in the district of Cape Breton — and the English tongue must prevail. The isolation of this interesting people in this remote island has been heretofore their protection, but eventually there must be an end of this when a wave of the world's great enterprise comes to Cape Breton, and alters its material conditions in essential respects. Still, looking at the very considerable number of this people at this time, and their tendency to increase despite emigration, it is obvious that their absorption by the mass of the English and Scotch population must be very slow, and in the nature of things a century hence there will be probably small settlements like those at Cheticamp, still isolated from alien influences, which will recall the old days of Acadie and Ile Royale.

VIII. A Short Description of the Port and Ruins of Louisbourg.

I may appropriately close this sketch of an island, which in many ways merits the title of *Royale*, by describing some of the present characteristics of the harbour which once held the fortunes of France at the portals of the Gulf of St. Lawrence. We must start from Sydney, which is prettily situated on a peninsula well adapted for a fine city, and is the headquarters of a large coal trade—one of those old places where, among the modern improvements of towns nowadays, a few quaint one-storied houses, tumble down barracks, and worm-eaten wharves, show it has had a history of its own. Sydney has one of the safest and largest harbours of America, and has been from the earliest times in the history of Cape Breton the constant resort of vessels engaged in the fisheries or in the commerce of this continent. Its very spaciousness, however, prevented it being chosen as the site of the fortress which the French constructed in the first part of the eighteenth century. Its broad entrance, its easiness of approach from different directions by land and sea, and its freezing for some weeks in winter, were facts that left it out of the competition for the capital of Ile Royale. During the French *régime* it had an uneventful history. A few Frenchmen settled in its vicinity and engaged in fishing or farming in a small way, but at no time until the fall of Louisbourg, in 1758, did it engage the particular attention of the French government. St. Peter's, St. Anne, Inganiche and various places in Labrador were the places preferred by the French and the Acadians. One of the most noteworthy events in its early history was the fact that it was in this spacious haven that the Canadian Le Moyne d'Iberville, famous as the founder of Louisiana, and for his exploits on land and sea, obtained the aid of a large band of Micmacs, and then sailed for the Bay of Fundy and the coast of Maine, where he won a signal victory over a small fleet of English cruisers, and destroyed the fort of Pemaquid, one of the frontier defences of the New England settlements. Here, too, Admiral Sir Hovenden Walker anchored his fleet during the September of 1711 after the great loss he sustained while on the way to Quebec. It was here he came to the determination to sail to England without striking a blow for her honour and gain in America. No memorial of this unfortunate expedition remains on the shores of Spanish Bay. The following *facsimile* of the inscription which he affixed on a board among the forests, that in those times overhung the banks, would never have been known to us in these days had not he himself boastingly told us, in the memoirs of that ill-fated voyage that he has left behind, that he had in this way asserted the claim of England to Cape Breton.[1] Having distinguished himself by this dis-

[1] "Being inform'd by several Officers who had been there, that a Cross was erected on the Shoar with the names of the *French* Sea Officers who had been here, which I look'd upon as a Claim of Right they pretend to for the King, their Master, the Island having been always in the times of Peace, used in Common, both by the *English* & *French*, for lading Coals, which are extraordinary good here, & taken out of the Clifts with Iron Crows only, & no other Labour; I thought it not amiss therefore to leave something of that Kind to declare the Queen's Right to this Place; Having a Board made by the *Carpenter*, & painted, I sent him ashoar to fix it upon a tree in some eminent place where it most easily be seen." Ex. from Walker's "Journal," p. 150.

play of empty bravado he sailed away without even striking a blow at the relatively insignificant French port of Plaisance on the dreary shores of Newfoundland.



From time to time French corsairs found shelter in the sheltered nooks and creeks of this noble port, but we have no record of any event of moment that signalized its history after the departure of the greatest fleet that ever anchored in its waters. In 1781, before Sydney town was founded by DesBarres, a famous sailor, La Pérouse, who, like Cook, was to meet his death in later years, while on a voyage of discovery in the Pacific ocean, commanded one of two large French frigates that fought an engagement off the harbour with four English ships of inferior strength, which were convoying some transports to obtain a supply of coal for the use of the troops at Halifax. This affair was hotly contested for some hours, but it does not appear to have resulted in any decided advantage to either side.[2] La Pérouse is but one of the many great sailors like Dundonald, La Roncière le

[1] In the name of the Father, Son and Holy Ghost, Amen. Greeting: to all Christ's faithful subjects, Anna by the Grace of God, Queen of Great Britain, France and Ireland, Defender of the Faith, of these islands commonly called Cape Breton, Proprietor and Sovereign. In testimony of which this monument has been erected by Her Majesty's most faithful Servant, D. Hovenden Walker, Knight, Commander in Chief and Admiral of all her Royal Navies in America. This month of September in the year of our Lord MDCCXI.

[2] See Brown, "History of Cape Breton" (382–384), who cites the French and English accounts of the fight.

Noury, Cloué and others less distinguished, who have visited Spanish Bay in later times and admired its commercial capabilities and its picturesque features. The history of Sydney, after it became the capital, was for years the history of Cape Breton. Here DesBarres fought his battles with the officials and the commander of the garrison, that occupied for many years the barracks, of which a few ruined buildings still remain on the northern end of the peninsula on which the town is built. Here and there one-storied, low-eaved houses, often buried in the heavy snowfalls of winter, tell of the humble little town where men fretted and fumed with all the importance of officials, or toiled to make a living in that distant outpost of England's empire. The town has had a sluggish growth during its century of existence, and it is only within a few years, with the development of the coal mines in the vicinity, that it has thrown off the apathy of the past and taken a place among the active mercantile communities of Nova Scotia. Now that this old place, situated on a peninsula admirably adapted for a large town, has direct railway connection with the rest of the continent, it sees before itself a future which it could never have had whilst it was practically isolated from the rest of the continent except by sea. At last Sydney, from the Atlantic shore, can, in a metaphorical sense, clasp hands with its prosperous sister town, amid its environment of mountains on the fair Pacific coast. It has an energetic competitor in North Sydney, some six miles lower down the harbour, not far from the entrance of the port, where the old mining association of Cape Breton has long done a large business, and near which the first English historian of the island lived for many years in a pleasant home, now showing the signs of age, but still charming for its flowers and shrubberies and its vista of the great sea beyond the cliffs. In the summer days the harbour of Sydney is visited by vessels of the French fleet[1] that protect the fisheries on the coast of Newfoundland, and the descendants of the Basque, Breton and Norman adventurers of old still drag up the riches of the sea on the Grand Banks where the codfish appear as prolific, as in the days when those sailors first explored the unknown waters of eastern America. By the irony of fate, the only remains of French dominion now in the gulf of St. Lawrence are the insignificant islands of St. Pierre, Miquelon and Langley, off the southern coast of the great island, to which the names of Baccalaos, Terre Neuve, Avalon and Newfoundland have clung from the days of Cabot and Cortereal to the present. Louisbourg is in ruins, and the French flag is no longer seen in that lonely port, but floats only from the mastheads of ships of France in the very harbour which they neglected in the days when her king was master on his royal island.

After leaving the old town of Sydney we have to travel for a distance of at least twenty-four miles over a fairly good road which offers no particular attractions except for a few minutes when we cross the Mira river, a noble stream which broadens, some miles from its mouth, into a long expansive lake surrounded by well-wooded hills, and is justly named Grand Mira by the people. Glimpses of Catalogne Lake and of the great ocean away beyond to the eastward help to relieve the monotony of a rugged landscape.

[1] Until a few years ago the French flag floated from a tall staff on a grass plot near the water's edge in front of a large white house, with wide generous verandah and green shrubberies, which was and is still one of the conspicuous features of the harbour side of the town. Within a stone's throw of this old mansion—whose framework is now nearly a century old—have anchored the vessels of the Newfoundland squadron for forty years and more, and in its quaint, low rooms, fitted with mementos of French sailors, of many eminent men known in the naval history and in the official records of France, like Cloué and La Roncière Le Noury, have partaken of the hospitalities of the kindly owner, the late Senator Bourinot, long a vice-consul of France.

We pass a number of not too well cultivated farms, each with its little homestead of logs or sawn lumber, chiefly occupied by Scotch settlers. Gradually we can smell the fresh salt air, that tells us of our nearness to the sea, and suddenly emerging from a desolate looking country, covered with small spruce, or with stumps and rocks where there happens to be a little clearing, we find ourselves on the hills which overlook the harbour, which stretches before us from northeast to southwest. If the day be foggy and dull — and there is a prevalence of such weather on that southeast coast of Cape Breton — the feeling that comes to the visitor is one of intense loneliness as he surveys the scattered houses, the almost deserted port, the absence of any commercial activity, and the wide expanse of ocean stretching away to the eastern horizon. This feeling is naturally intensified by memories of the very different scenes that were witnessed on the same harbour in the middle of last century. It is by such contrasts between the past and the present that a place like Louisbourg makes the most impression on the mind. A large bustling city would cause us almost to forget the historic days of old, and could not have the charm of the lonely aspect that the site of the once famous town now wears.

This harbour, so full of memories, possesses natural characteristics which are peculiar to itself and after a while bring with them a feeling of rest and isolation from the great world which frets and fumes away beyond it, and has brought none of its activity to its now relatively deserted shore. It is a striking feature of Louisbourg as of the coast generally of Cape Breton, that the landscape ever and anon assumes a sad aspect, arising from the misty clouds that at certain seasons obscure the sun, and give darker shadows to the gloomy spruce that fringes the shores of the island. A similar feeling of sadness passes over the spirit when we contemplate the great prairies of the northwest, which, by their wide expanse and fitful shadows, recall the great sea that beats against the rock-bound coast of Cape Breton. Louisbourg is, indeed, a place to see Nature in its varied aspects. The very atmospheric changes, so sudden at times, somehow seem adapted to the varying moods of life. One day is all bright and the waters of the port sparkle in the sunshine, the gulls and seabirds take lofty flights in the pure atmosphere, the patches of stunted spruce assume a deeper green, and the lights and shadows play above the ruined ramparts of the old town to which the eye ever turns in remembrance of the past. Then in a moment the wind veers round and as we look to the southeast we can just see above the horizon a low bank of grey shadow which moves forward, and soon enshrouds the islands at the entrance, and the lighthouse on its rocky height in a cloud of mist, which increases steadily in volume until at last the point of land on which the old fortress once stood is no longer visible to the eye. Then, a few hours later, the wind changes once more and a cool breeze comes from the northwest, and the fog is driven out to sea again, and the harbour is revealed in all its solitary beauty. Or perhaps the wind rises to a storm, and then the waves dash with fierce velocity on the rocks and islets that bar the ocean from the ports, which, despite the tempest outside, seems remarkably unruffled, and affords a safe anchorage to the boats and vessels that are now its sole occupants instead of the great fleets of stately ships that once whitened its waters in the days of old.

Let us walk around this harbour on a bright day when the fog, for once, has found its way beneath the horizon, and take a brief survey of the natural features of this curious landscape, and of the memorials that still remain of the old régime. The Lighthouse Point, or rocky promontory that forms the northeastern entrance, is the terminus of a great mass of rocks, where the inevitable spruce has obtained a foothold, and the

varied flora of this northern region bloom amid the crevices or on the swampy ground which is a prevalent feature of the country. The beach is one great collection of rocky debris which seems to have been thrown up by some giant effort of nature, and it requires no slight effort to find one's way amid these masses of rock piled on rock, worn smooth as marble, by the unceasing action of the waves, and covered at their base with great bunches of entangled seaweed and shells which glisten like so many necklets of amber beneath the sunlight as it peers into the little pools that have been left by the tide when it has receded to the bosom of mother-ocean. Some few paces eastward of the lighthouse, a mound or two of turf represents the battery which in Wolfe's time did so much execution on the works at Goat Island, which is about a third of a mile distant in a southerly direction,—a mass of rock and earth, where old cannon balls and pieces of artillery are now and then turned up by the waves as they roll during the equinoctial gales on its rugged shores. On these islands that guard the port seabirds without number still build their nests, and at certain seasons of the year, when the visitor lands among the rocks, they rise by myriads into the sky and hover like a great cloud above the islets. The lighthouse, a tall wooden building with a fixed light, stands securely on a pinnacle of rock,—a dreary home in the storms of autumn and winter, and the fogs of spring. A dark grey tower of stone would better harmonize with the dull colours of sky and ocean that generally prevail in this sad country than the white structure from which the signal is flashed to the passing ship. More than a century and a half has passed away since the French built the first lighthouse on the same spot, and with the exception of a year or so when the lantern was destroyed by fire a light has burned unremittingly among the rocks of this prominent point of Cape Breton.[1] From here sometimes—but rarely at this point however—in early spring one can see the vast fields of ice, stretching as far as the eye can see, blockading all approaches to the port as in the days when Pepperrell's little expedition lay anchored at Canseau. But the westerly winds soon scatter these ice-floes, and send them to melt in the warm current of the gulf stream, and the keeper from his lantern tower looks once more on the wide expanse of ocean, with all its varied moods in that uncertain region where storm and sunshine are ever fighting for the mastery. A short distance from the lighthouse there is a white modern cottage, a pleasant summer home, whose green lawn slopes to the edge of a little pond guarded from the encroachments of the ocean by a causeway of stone. Here is a vista of land and sea of rare attraction for the wearied resident of the town,—solitude and historic memories, the sea in all its grandeur,—no one can ask more in the summer days.

Following the sinuosities of the harbour we come to where once stood the careening wharf of the French, and here, when the writer last saw the place, was a high and long pier for loading vessels with the coal brought some twelve miles from the mines by a narrow guage railway. In this neighbourhood when the railway was built there was to be a new town of Louisbourg and a large coal business was to be prosecuted in summer and winter, but the pier has fallen into decay — it is probably removed by this time — the railway has been derailed in places, the wooden trestle work over Catalogne Lake has rotted away, and Louisbourg has again been deserted for the town of Sydney. The road

[1] I find the following notes by M. Marmette in the "Canadian Archives," (1887, cccxv, cccxxi, cccxxiii):—"The lighthouse lantern was kindled on the first of April (1734). It was perfectly visible for six leagues out to sea * * Nov. 10, 1736. The lantern of the lighthouse has been burned, and they have to rebuild it * * Oct. 30, 1737. Rebuilding of the lighthouse."

round this rugged promontory runs through great rents blasted in the rocks, and nears at times the very verge of the precipices. At intervals are fishing stages and mouldering warehouses recalling old times of large business activity. We pass by the little north-east harbour which forms so safe a haven for the trading schooners and fishing boats that are always moored here as in the old times. As we walk down the west side towards the site of the French town we notice that the land ascends gently from the very edge of the harbour and forms a pleasant site for the present village of Louisbourg, a collection of thirty or more whitewashed or painted houses, a canning factory,[1] and two or three churches.[2] Some shops stand by the roadside or in the vicinity of the wharves, where there are generally fish drying on flakes. Some meadows, covered with a spare crop of grass, or late vegetables, represent the agricultural enterprise that is possible on a thin soil, which receives little encouragement in this changeable atmosphere of fog and rain, in this country where the spring is a delusion and the summer too often a mockery since it is so short, though in July and August there are days whose cool soft temperature is most delicious. The old ruins of the grand, or royal battery, about midway on the west side are quite visible and as we survey them, map in hand, it is easy enough with a little patience and an effort of the imagination to trace the lines of the works. Here, however, as elsewhere, we can pay our tribute to the thoroughness with which the English sappers and miners, one hundred and thirty years since, obeyed their instructions to destroy the old fortifications, and leave not one stone on another lest they might at one time be found serviceable by an enemy. Just before coming to the barachois, so often mentioned in the accounts of the two sieges, we see before us a large wooden chapel with a prominent steeple — the most pretentious ecclesiastical building in the place — and the cross that points to heaven is so much evidence that Rome claims her votaries in her old domain, and that the hatchets of the Puritan iconoclasts of Pepperrell's time were of little avail after all, but that her doctrines still flourish in the island of Cape Breton. We cross the barachois by a rude bridge and follow the road along the beach for a quarter of a mile, or so, and come to a collection of fish stages and wharves made of poles laid on logs, and all redolent of the staple industry of Louisbourg. Then we turn up a hill, and soon find ourselves on the grass-covered mounds of the old town. If we take a position on the site of the king's bastion, the most prominent point of the ruins, we see to the southwest the waters of the spacious bay of Gabarus. Immediately below us are the remains of the casemates[3] where the women and children found a refuge during the last siege. Looking at the three that remain, it is easy to see that any number of persons must have been huddled together in a very pitiable fashion. Sheep now find shelter within these rudely constructed retreats. All around them in summer time there are patches of red clover, mingling its fragrance with the salt sea breezè, and reminding us how often this grass grows rank and rich in old graveyards, as it were to show how nature survives the memorials of man's ambition and pride. The low rugged country that stretches for a league and more to Gabarus presents all the natural features of rock and swamp, with patches of the alders and the stunted fir, that seem to flourish best on this poor bleak coast. It is quite

[1] This modern enterprise was managed for some time—perhaps is still — by a man from Maine; so Pepperrell's state still claims a place after this prosaic fashion in the old port which he won for England.

[2] See illustration of the modern village of Louisbourg, from an excellent picture by a Sydney photographer, Mr. Umlah.

[3] See illustrations at end of this work.

easy to follow the contour of the fortifications until they come to the old burying grounds near Rochefort and Black Points, where hundreds of New Englanders and of French and English soldiers found their last resting place in 1745 and 1758. No tombstone or cairn or cross has been raised; the ground has never been blessed by priest; the names of the dead are all forgotten; Frenchmen, Englishmen and Colonists, Catholics and Puritans, now sleep in close vicinity to each other, regardless of the wars of creeds, beneath the green sward which the sheep nibble with all the avidity of their kind.[1]

The deep ditch near the king's bastion is still full of water, and the stumps of the picket palisades which were raised in 1745 between the Princess's and the Brouillon bastions are visible in places. We can see too in the water the remains of the bridge which stretched across the shallow pond between the Maurepas and Grève batteries. The places of the numerous stages for drying fish in old times on the harbour front can still be traced with a little trouble on the shore at low tide. On the site of the town there are piles of brick and stone which have been dug up by the present inhabitants when they require materials for building. Many of the chimneys in the humble cabins of the fishermen are built of brick from France or perhaps from New England. Cannon balls and bomb-shells are frequently found at low tide on the shores, and more than once old cannon have been dug up in the sand and mud. It is rarely however, that any relics of interest or value are now discovered at Louisbourg. Delving in the debris of an old foundation, probably that of the hospital, the writer once found some pieces of tarnished gold lace which may have belonged to an officer wounded in the last siege. But such a treasure as was found at Loran—to give the place its now familiar name—has, never to my knowledge, been turned up among the ashes of the old town. All articles of value were taken away by the people, if indeed there were ever many in a place which relatively few persons regarded as a permanent home.

Those who have ever paid a visit, of late years, to the city of Cambridge, in Massachusetts, and lingered for a while under the noble elms that shade its wide streets, and cluster around the buildings of Harvard, may have noticed a small gilt cross above one of the entrances to Gore Hall, where the great New England university has housed its principal library. One must, at first, wonder why this religious symbol, only found as a rule on Roman Catholic buildings, or Anglican churches of an extreme type, should adorn the doorway of a seat of learning, in once Puritan New England. On inquiry we find it is a historic link which connects the old Bay State with the distant and almost forgotten port on the windy eastern coast of Cape Breton. Nearly a century and a half has passed since this simple cross was taken from its place on a Louisbourg church, probably by one of the soldiers of Pepperrell's expedition at the command of one of the Puritan clergymen who regarded it as a symbol of idolatry. It was carried to New England and forgotten among other relics until an enthusiastic and scholarly historian brought it to light and gave it

[1] Mr. Faucher de Saint-Maurice, F. R. S. C., has written a little book, with the title "Sept jours dans les Provinces Maritimes," (Quebec, 1888), of which thirty pages are devoted to a bright description of St. Peter's, the Bras d'Or, Baddeck, Sydney, and Louisbourg. He mentions a fact not generally known, that the English had their cemetery on Point Rochefort and the French theirs in the immediate vicinity, but nearer Black Point. It was in this latter place the English Catholics were also buried. The graves of the New Englanders who died of disease in 1745-6 took up most of the space at Point Rochefort.

the prominent position it now occupies at Harvard. Here we have undoubtedly clear evidence of the extreme liberality of these days that would make old father Moody lift his voice in stern rebuke of the degeneration of his countrymen, were he permitted by a higher power, to return to the land where he once denounced the Roman Catholic religion with so much bitterness of tongue. But now-a-days in the very state where Governor Endicott cut the red cross from the English flag, the same symbol not only invites the people to numerous churches but seems to offer a benison to the youth of New England who pass beneath the portals of Harvard's spacious library.[1]

For many years after the destruction of the famous fortifications, and before the resistless action of the ocean had buried deep beneath the sand the remains of the vessels sunk by Chevalier Drucour at the entrance of the port during the second siege, the fishermen of Louisbourg often alleged they could see the cannon of the ships lying among the rocks and seaweed as their little craft lay becalmed when the wind went down and the waters presented an unruffled surface which revealed their secrets many fathoms below. But such stories now are no longer heard in the old port, and the most imaginative eye can-

not penetrate the depths of the waters where gallant ships were sacrificed in a vain hope to prevent the entrance of the great English fleet that blockaded the port. Cannon balls and bomb-shells are at times tossed up by the sea from the sands and rocks where they have been embedded for years, but it is rarely now that cannon are found. Nearly fifty years ago there was one interesting "treasure trove" in the form of an old gun, which is clearly a memorial of several centuries ago. The hooped cannon,[2] of which I give a sketch on this page, was dug up in the mud of the western shore of the harbour, nearly half a mile to the west of the ruins of the Grand Battery.[3] A distinguished Nova Scotian archae-

[1] In a letter to the author, Dr. Justin Winsor, the librarian of Harvard, says: "The story is that the iron cross above the door of our library was brought back to Massachusetts after the siege of Louisbourg (1745) by the returned troops. When I found it in 1877 in the cellar of the library, it had a label on it to that effect. I then placed it above the door, and had it gilded. It is supposed to have been on the Catholic chapel in Louisbourg [in the citadel or hospital church ?]. I say this much and give a cut of it in vol. ii. of 'Mem. Hist. of Boston'" (frontispiece).

[2] See *supra*, sec. VI, for an account of a similar gun found at St. Peter's, C.B.

[3] The exact place where this gun was found can be seen by looking at the plan of the city and harbour of Louisbourg at end of this work. It was on the shore immediately in front of the little pond which is seen marked midway between the grand battery and the barachois, where Hales's Regiment is marked.

ologist has thought this memorial worthy of an elaborate paper,[1] in which he indulges in a good deal of interesting speculation as to its original ownership. Its workmanship shows it to have been one of those forged pieces of ordnance common in the early part of the sixteenth century, and not unfrequently used until, and perhaps even after, the beginning of the seventeenth century, when cast metal guns came generally into use. The gun in question is made of bars of malleable iron, encircled by ten rings or hoops in accordance with the fashion of those early times. It has a length of about five feet, and a diameter varying from four inches at the muzzle to nine inches at the shoulder, behind which is a chamber for the reception of a breech block, which was kept in its place by iron bolts, and was placed in or taken out of its chamber by either a leather or iron handle at the top. The gun otherwise is in excellent preservation, despite the corroding rust that has eaten into the iron that was forged by a cunning gunsmith centuries ago in some foundry across the seas. In speculating on the history of this ancient weapon, one soon finds himself launched upon a sea of doubt. Now it is a Portuguese vessel that in the early times of maritime adventure in eastern American waters carried this gun. Again it belonged to an English ship, the Delight, the "Amiral" of the little fleet of three vessels in which the gallant Englishman, Sir Humphrey Gilbert, sought to win honour and territory for his country in those times when England was at last entering on that field of maritime adventure which was to give her in the course of centuries the greatest colonial empire the world has ever seen. The place where the Delight was lost is involved in obscurity, though it has been hitherto generally supposed that she perished in "the flats and dangers" of Sable Island, until the Nova Scotian antiquarian, already mentioned, shipwrecked the "Amiral" in a sheltered part of Louisbourg harbour.[2] But if we study the record of the voyage of the English adventurers we may admire the ingenuity of the Nova Scotian writer, but can hardly come to the same conclusion.[3] We have no conclusive evidence that the Englishmen ever reached and entered a port in Cape Breton, though it appears in leaving Newfoundland they shaped their "course unto the island of Sablon, if conveniently it would so fall out, also directly to Cape Breton." They spent eight days in the navigation between Cape Breton—that is to say the cape of that name—and Cape Race in Newfoundland, but they never got sight of any land all that time, seeing they were "hindered by the current," and at last "fell into such flats and dangers that hardly any of them escaped," and where they lost their "Amiral with all the men and provisions not knowing certainly the place." They were entirely out of their course, and although they have left us several reckonings they are so much at variance that even Dr. Patterson despite his zeal to establish his point is obliged to admit the difficulty of coming to a correct conclusion as to the exact situation of "the flats and dangers," and to fall back on a series of surmises and probabilities to bring the Delight into Louisbourg harbour. He would make us believe, for instance, when he is literally at sea, that the mate's

[1] This paper was read by Rev. Dr. Patterson before the Royal Society of Canada during its May meeting, 1891, at Montreal, but has not appeared in the 'Transactions' for that year, owing to the pressure of other papers. The writer has kindly allowed me the privilege of studying this essay, whose careful preparation all must admit, even while differing entirely from its conclusions.

[2] In his paper on the Portuguese discoveries in 1890 ('Trans. Roy. Soc. Can., viii. sec. 2) he thought it was a Portuguese gun, but in 1891 he changed his mind.

[3] The account of the voyage of Sir Humphrey Gilbert will be found in Hakluyt (Goldsmid's ed.), xii. 345–350, 363–367.

reckoning was inaccurately copied in the printing, when it is clear on the face of the record that all the reckonings were wrong. The master of the Delight, in the relation which he has left behind, tells us that Sir Humphrey Gilbert and all the captains "fell to controversie" of the course, when within twenty leagues of the Isle of Sable. Sir Humphrey contended that the reckoning kept by the master of the Amiral was untrue. If the vessels had been off Cape Breton—the best known cape in those waters—there could have been no difficulty as to the course. It is equally clear that they could never have entered so safe a port as Louisbourg, for there is no mention of a harbour, but only of "flats and dangers," where the whole fleet was nearly lost. All the details of the shipwreck, as they have come down to us, show clearly that it must have been on some unknown shore that the disaster happened. On an August day, when the rain and mist prevented them seeing a cable length before them, they saw what at first they thought were "white cliffs," but was evidently the sea breaking on the rocks, though they could not descry any land. Presently the "Amiral struck the ground, and had soon her stern and hinder parts beaten in pieces, and thereupon the two other vessels made off seaward." We are told that there was not enough water upon the sand for the other vessels, much less for the largest, the Amiral, that drew fourteen feet. A number of the crew of the Delight succeeded in saving themselves in a pinnace of the vessel, but the captain and many others were drowned. "And when the sixteen were in the boate," continues the eye-witness of the wreck, Clarke, the master, "some had small remembrance, and some had none, for they did not make account to live, but to prolong their lives as long as it pleased God, and looked every moment of an hour when the sea would eat them up, and the boat being so little and so many men in her." Not a word is said of the fleet having seen land or entered a harbour—no such inference can be drawn from any of the narratives before us. It is almost certain had they entered a port like Louisbourg they would have given us an account of its natural characteristics and of the incidents of their visit, just as they did in the case of the ports of Newfoundland, and in all probability Sir Humphrey Gilbert would have claimed the sovereignty of his queen over the island by some formal act. One knowing Louisbourg must feel that had the voyagers once reached that port no such story of disaster would have been told. The Delight might have been wrecked on the rocks that bar the entrance of the port, but then not an atom of her, certainly not a piece of ordnance, would have been left to tell the tale. The place where the old gun was found is on the western shore and within the peaceful haven, and however the storm might have raged outside, the fleet could have anchored safely and been hardly tossed by the relatively slight commotion that prevails in times of the most furious winds. The whole story of the wreck, and of the escape of the pinnace, speaks of shoals and rocks, and not of one of the safest and calmest harbours in American waters. If the fleet had found itself once moored in this fine port, we should assuredly have had a very different story from the adventurers who have left the records of that disastrous voyage behind them. It is idle to connect the finding of an old cannon in the mud of the Louisbourg shore with the ambiguous stories of sailors out of their reckoning, and unable to see any land, but only the sea breaking on shores and rocks. In olden times vessels of many nations sought refuge in Louisbourg harbour, and it was not unusual for many of the large class to be armed that they might defend themselves against the savages of "the

new found lands," or against their rivals who were exploring those far distant seas.[1] It is quite easy to believe that these vessels would often be armed with old weapons, which could be bought cheap in the ports of Europe. Some storm-tossed vessel may have found its way into the haven, and may have been left to rot on the shore, while the crew were taken off on the vessels that began to frequent Louisbourg in the beginning of the sixteenth century, or perhaps the old weapon was thrown overboard as useless. But the facts, so far as they have come down to us, by no means establish that Sir Humphrey Gilbert ever entered the famous old port.

As one looks carefully in these days at the natural position of the old fortress, it is quite obvious that it must have been extremely weak on the land side, when once an enemy obtained a footing on shore. The most dangerous point was, of course, Gabarus Bay, and the French would have been wise had they built strong permanent forts or batteries at every cove where there was a chance of an enemy landing. The history of the last siege shows that the French were quite aware of the necessity for such batteries, but they had no force strong enough to maintain even the works they were able to construct with the materials close at hand. In endeavouring to prevent the landing they had left the town itself almost undefended. Then, when the enemy was established in force, the French were not able to prevent them taking possession of the northeast entrance, and the green hills which command the town. The grand battery was never of any use, and the one at Lighthouse Point was also deserted at the first sign of peril. Both of these works, if held by the French, could have thwarted the plans of the English for some time; but as it was there were no men to spare for these defences, if indeed they were in a condition to resist attack for many days. The town, then, from the land side, stood isolated and dependent entirely on its own defences. From the sea on the other hand, it was much less liable to danger. We have evidence of this in the fact that the island battery at the entrance, during the two sieges, for weeks kept the fleet outside of the harbour. If the Lighthouse Point had been defended by a powerful fort, garrisoned by a sufficient force, the entrance would have been almost impregnable.

The rocky islands that lie between the ocean and the port and make it so secure a haven in the most tempestuous season present a very picturesque aspect as we survey them from the heights of the old town. They seem to form a sort of cordon of rocks and shoals, on which the sea rushes in all its impetuosity, only to find itself stopped in its fierce desire to reach the peaceful haven. The spray rises in times of storm in great clouds of mist on these dangerous rocky ledges, and then, as soon as the wind subsides, there is hardly a ripple to tell of the danger that lurks beneath the unruffled surface that hides these rocks where death ever awaits the storm-tossed or careless sailor. It was on one of such rocks in the vicinity of Porto Novo, a short distance to the northeast of Louisbourg, that the French frigate Chameau on her way to Quebec, was shipwrecked one August night in 1725. All the ranks and professions were represented on the hapless vessel, "grande et belle flûte du roi, commandée par M. de Voutron." An intendant of Canada,

[1] See App. VIII (3) to this work, where an account is given of the visit of the Hopewell of London, in 1597, to Louisbourg harbour, where a Biscay vessel, whose crew had robbed the Chancewell, the consort of the English ship, when cast away on the coast of Cape Breton, "bent a piece of great ordnance at us." When we consider the many armed vessels that visited Louisbourg for centuries it is not difficult to account for the appearance of an old gun in the mud of the port.

a governor of Three Rivers, black-robed priests, officers and soldiers, peasants and their wives, brave men and fair women, representatives of many families in New and Old France perished, and "all Canada was placed in mourning and lost more in one day than she had lost by twenty years of war."[1] Here Admiral Holbourne's fleet, surprised by one of those furious gales that often visit the coast, expected every instant to be tossed on the rocks over which the sea rushed with great billows of foam, and only escaped at last with the masts and rigging torn away by the fury of the wind, and the loss of one gallant ship that was carried among the rocks of St. Esprit, on the southern coast of the island. The shores of Cape Breton from Cape North to the most southern point on the Atlantic, could tell many a sad story of disaster to the numerous vessels that have been hurled on its reefs from the earliest times since the gulf became a highway of commerce. Even the loss of the Chameau has had a parallel in that of the Auguste, wrecked on her way to Europe in the autumn of 1761 on some unknown part of the precipitous northeastern coast, with a number of Canadian families, and many soldiers of the Bearn and Royal Rousillon regiments, who had escaped the dangers of war that they might meet an inglorious death amid the roar of the breakers and the tempest on the desolate shores of the island which, like the Canada they had left, had passed away from France for ever.[2]

As we stand on the ruined ramparts, let us for a moment forget the prosaic scene that forces itself upon us on every side in these days of the old port's departed greatness, and recall the history of the past with its enterprising adventurers and discoverers, its bold soldiers and famous sailors, its squadrons of stately ships and its regiments drawn from France, England and the thirteen colonies, then developing into national life and activity. Cape Breton in these times is merely a fine island to the tourist who travels through its picturesque lakes, and surveys its noble ports and bays only in the light of the prosaic present. Its geological features and its rich coal deposits attract the scientist. Others speculate with the eye and brain of the capitalist on the opportunities that its mineral and other resources, and its admirable position at the entrance of the Gulf of Saint-Lawrence, offer to enterprise and energy. Some still look forward with reason to the time when Sydney and Louisbourg will become great ports of the world's commerce, and more than realize the conceptions of the astute Raudots nearly two centuries ago. But these are not the only thoughts that will press upon the mind at times when we travel over the historic ground that lies between the old site of Port Toulouse and the ruins of Louisbourg. We can see in memory the sails of the Basque and Breton fishermen hovering centuries ago off the bays of the island which had no name and hardly a place then in the rude maps of the world. We can see Spaniard and Portuguese venturing into its unknown rivers and harbours, and giving them names which were so many recollections of their homes across the sea. At times when the vessels of many nations anchor in its safe havens we hear a curious medley of tongues; the Saxon words of Kent and Devon, the curious dialects of the Bay of Biscay, the sonorous Spanish and the softer Portuguese, the old Celtic language of Bretagne so closely allied to that of the old Britons across the English Channel. The years pass by, and the island still remains a solitude save where the wandering Micmac raises his birch lodge and lights his fire on the shores

[1] Charlevoix, 'Journal Historique,' Ed. i, p. 69. A "flute" is a long vessel with flat ribs, and used generally as a transport.

[2] See App. XVI to this work.

of the inlets and rivers of the noble lakes, then in the sublimity of their ancient beauties —vistas of the great forests untouched by the axe, and of mountains where the foot of European never trod. Then suddenly a town rises on its eastern shores—a town with walls of stone, where the cannon and the lilies of France tell of the ambition of the nations of Europe to seize the new world, with its enormous possibilities. Then it is no longer the sails of adventurous fishermen that dot these waters. We see great fleets with their armaments of heavy metal ranged for miles off the harbour that now represents the power of France. We can hear the shouts of triumph as the flag comes down on the *Vigilante*, surprised on her way to succour Louisbourg. We can see the dim hull of the *Aréthuse* stealing, amid the darkness of night, through the vessels of the blockading squadron, to tell the French king that his dream of empire in America is fast drawing to an end. We can see the old leaky *Notre-Dame de Délivrance*—no longer a name of auspicious omen—carried into port with its rich cargo of gold and silver from the mines of Peru, amid the cheers of the sailors on the English ships, and of the soldiers as they crowd the ramparts of the town over which the French flag still floats in mockery of the hopes of De Ulloa and his French companions when they sought the port as a safe refuge after their storm-tossed voyage from the Spanish colonies of the south. We can see the men working like so many ants in the trenches, and manning the batteries from which the shot flies fierce and hot upon the devoted town, making great breaches in its walls. Farmers, fishermen, and mechanics of New England, sturdy, energetic, sharp-witted, full of wise saws and scriptural quotations specially adapted to themselves and their own wishes; men from the grass-meadows of Devon and the hop-gardens of Kent; stalwart highlandmen whose hearts still go across the water to Prince Charlie, or linger in their Scottish glens which may know them no more; sturdy English sea-dogs, as ready to swear as to fight; the self-reliant, calm merchant of the Piscataqua; the tall, gaunt form of Wolfe, with his emaciated face on which illness had left its impress; Duchambon and Drucour with disappointment and care depicted in their eyes, as they survey the ruins of their fortress; silent sullen Frenchmen mourning their fate as they see the red cross of England flying above their citadel; a gentle cultured lady amid the storm of shot and shell, showing Frenchmen that their women would, if they could, fight for France and her honour to the last; a sturdy sailor who, in later times, was to give England the right to claim an Australasian continent in the Southern seas. All these pass in a rapid panorama before our eyes as we recall the shadowy past with its associations of victories won on three continents. Here we stand on ruins which link us with the victories of Plassy, Rossbach, and Minden — with new empires won in Asia and Europe, with the rise of dynasties, and the defeated schemes of kings and princes, once dominant in Europe. Three continents were here allied in the days of Pitt, and whether we walk over these old ruins in Cape Breton or bow reverently before the monuments that tell of England's famous men in her ancient Abbey, and see most conspicuous among them all the stately figure of Chatham, with his outstretched arm, "bidding England to be of good cheer, and hurling defiance at her foes," we feel that though this land of ours be new and have few of those historic memories that make every inch of England or of France so dear to the historian, the poet and the novelist, yet here at least at Louisbourg as on the heights of Quebec, and on the banks of Lake Champlain

we have a rich heritage of associations that connect us with the most fascinating and momentous pages of the world's history. But we soon awake from this reverie to see around us only grassy mounds, and in place of the noble fleets which once whitened the sea, from Lorembec to Gabarus, with their great spread of canvas in days when ships were objects of interest and beauty, and not uncouth masses of iron and steel, we see now but a little fishing-boat, running merrily with a favouring breeze through the entrance of the port, perhaps a sail or two in the distant horizon, or a lengthening pennant of smoke which tells us of a passing steamer engaged in the commerce which long since left this French port, once the hope of France.

APPENDIX.

BIBLIOGRAPHICAL, HISTORICAL AND CRITICAL NOTES.

In these notes it is the object of the writer to give a complete summary of all the historical and other works which relate, in whole or in part, to Cape Breton, or Ile Royale. The books and pamphlets which refer exclusively to this island are few in number, not more than a dozen or so in all; but there was a period in French, English and American history when it obtained an important place in official and historical records. The historians of the wars between England and France from 1740 to 1763 — wars for supremacy in America — give prominence to the struggle for the possession of Cape Breton, then a bulwark of French ambition on the continent. In the English and French archives, and in the journals, memoirs and current literature of the time, Cape Breton takes up no inconsiderable space. References are given to all this literature, which has been consulted by the author, whenever accessible to him. Fortunately for him in Canada and New England the public libraries or the collections of private individuals possess all the more important sources of information from which he has drawn in the preparation of this work. He has not deemed it necessary to dwell at any great length on subjects where there is much literature of a debatable and argumentative character, like the Norse, Basque and Cabot voyages, but has confined himself to a meagre reference to the books on such questions and to a few critical remarks on points touching Cape Breton. In such cases the Narrative and Critical History of America affords, as a rule, all the material necessary for a complete examination of the subject. In these notes it is not intended to do more than make special allusion to works relating to Cape Breton, and the various episodes of its history, and to supplement as far as possible the information already collated by other writers.

I. The Voyages of the Northmen.

Here we come to a field of literature, replete with vague speculation, and remarkable opportunities for the display not only of archæological knowledge, but of imaginative power. In saying this, the writer must not be understood as doubting the visits of Scandinavian voyagers to some part of northeastern America nine centuries ago. Labrador, Newfoundland, Cape Breton, Nova Scotia, and even parts of New England may have been seen by Biarne, Lief, and others of his countrymen, and there is obviously a historic substratum of truth in the sagas of the North. But at the same time one feels that none of the writers on the subject have been able to lift the veil of mystery that envelopes the lands the Norsemen visited, or to detract from the fame of Columbus, of the Cabots, or even of the Portuguese and Bretons who have at least left the impress of their language on the coasts of the Gulf of St. Lawrence. Without further preface, I may now refer my readers to the following works as affording them abundant materials for the study of this subject, which is very attractive in many respects, and illustrates the remarkable original research that is given now-a-days to American history and its sources of information.

"Antiquitates Americanæ sive Scriptores rerum Ante-Columbianarum in America. Samling af de L Nordens Oldskrifter indeholdte Efterretninger om de gamle Nordboers Opdagelsesreiser til America fra det 10de til det 14de Aarhundrede. Edidit Societas Regia Antiquarior. Septentrionalium. Hafniæ (Copenhagen), 1837." This work of Professor Carl Christian Rafn, was the commencement practically of the investigations and studies of the Norse voyages for the past fifty years, although Torfæus, more than a century before, had written a book on the Vinland Discovery ("Historia Vinlandiæ Antiquæ, etc.," Hafniæ, 1705). With Professor Rafn, were associated Finn Magnusen and Sveinbiorn Egilsson, but the former is really entitled to all the credit of the work. Rafn is responsible for the theories respecting the Old Stone Tower at Newport, Rhode Island, and the Dighton Rock near Taunton, Massachusetts, as relics of the Northmen; but while the bold speculations and conjectures in which he indulged are now pretty well discredited, his work must always obtain recognition as a standard authority to be consulted on the main question of the Norse voyages. It has been translated into several languages.

"The Pre-Columbian Discovery of America by the Northmen,with translations from the Icelandic Sagas," by B. F. De Costa (Albany N. Y., 1869 and 1890.) This work has for its principal object, as stated by the author, a well known American archæological and historical student, "to place within the reach of the English reading public every portion of the Icelandic sagas relating to the pre-Columbian discovery of America by the Northmen, and to the steps by which that discovery was preceded." He is a firm believer in the historical value of these old manuscripts, and in New England "as the scene of the Northmen's exploits." He is of opinion (like Rafn, p. 423) that the description of Markland "agrees with the general features of Nova Scotia," p. 94, *n.*

"The finding of Wineland the Good. The history of the Icelandic Discovery of America. Edited and translated from the earliest records by Arthur Middleton Reeves. With phototype plates of the vellum mss. of the Sagas," (London, Oxford University Press, 1890). This sumptuous work in 4to is the latest contribution to the subject by an American scholar, who accepts the old Norse records as authentic. The work shows much erudition, and is of great interest and value to the student since it gives not only the texts of the three sagas on which the theory of the American discovery is based, but collects the numerous references to America and its discovery which are found in the ancient literature of Iceland. Mr. Reeves, however, gives the date of Torfæus's first work on the Vinland discovery incorrectly (p. 97); it was first published in 1705 and not in 1715. He has obviously confounded the former with Histor.a Gronlandiæ Antiquæ, printed in the year 1715. An excellent review of the work is given in the Scottish Review for October, 1891. Mr. Reeves died in a railway disaster in 1891.

"Pre-Columbian Explorations, with critical notes on the sources of information," is the title of the paper by Dr. Justin Winsor, in the Nar. and Crit. Hist. of Am. (i. chap. ii.). Here, as in the case of all articles in this historical work, is found a critical reference to the principal literature that had appeared on the subject previous to 1889, when the volume was printed. It contains among other illustrations copies of Rafn's maps of Norse America, of Vinland, and of the Dighton Rock with its inscriptions. Dr. Winsor's conclusion is (pp. 67, 68) that "the weight of probability is in favour of the Northmen's descent upon the coast of the American mainland at some point, or at several, somewhere to the south of Greenland; but the evidence is hardly that which attaches to well established historical records." Both Reeves, and the writer in the Scottish Review, mentioned above, take exception to these and other remarks of Dr. Winsor, as underrating the value of the sagas and the importance of the Norse voyages.

"The Vinland of the Northmen", in the 'Trans. Roy. Soc. Can.,' (viii. sec. 2, art. 3.) by Sir Daniel Wilson, President of the University of Toronto, a well known archæologist, is especially interesting to readers of this work on Cape Breton because it refers to a curiously inscribed rock (of which a copy is given in the Trans.), found forty-six years ago at Yarmouth, Nova Scotia. The rock has been studied by various archæologists, but, as Sir Daniel Wilson shows, a close examination of it proves that it neither accords with the style or usual formula of runic inscriptions, "and for this and other reasons, the Yarmouth stone must take rank with the illusory Thorfinn discovered by the Rhode Island Antiquaries on their famed Dighton rock which still stands by the bank of the Taunton River." The writer also discusses the theory raised by one of the new generation of northern antiquaries (Professor Gustav Storm,) Professor of history in the University of Christiania, who would make Kjalarnes, the northern extremity of Vinland, to correspond with northern Cape Breton and the fiord into which the Northmen steered to have been Canso or some other bay of Guysborough County in Nova Scotia; but it does not appear certain that grapes ever grew wild on the Nova Scotia coast, except perhaps, in some favoured part of the present King's and Annapolis Counties. As a matter of fact, Professor Storm has not yet succeeded in weakening the weight of evidence in favour of some part of southern New England as Wineland the Good. His essays on the subject are given below:—

"Om Betydningen af 'Eyktarstaor' i Flatobogens Beretning om Vinlandsreiserne", published in Arkiv for Nordisk Filologi, November, 1885. See Reeves, p. 6.

"Studier over Vinlandsreiserne, Vinlands Geografi og Ethnografi," in Aarb. f. Nord Oldk, og Hist. Copenh, 1887, pp. 293–372. See Reeves, p. 98.

Sir Daniel Wilson's art. refers to Storm's "Studies of Vinland voyages published in the Mémoires de la Société Royale des Antiquaries du Nord" for 1888, a partial translation of the foregoing "Studier."

Another article by a Canadian writer is a paper by R. G. Haliburton, (a son of Judge Haliburton, best known as "Sam Slick,") read before the British Association at Montreal, in 1884, in which he expresses the belief that the vineclad country of the Northmen will be always sought in vain—a rather sweeping assertion, which Sir Daniel Wilson, in the article just noticed, does not agree with.

In the 'Trans. of the Roy. Soc. of Can.' (viii. sec. I, art. 5,) there is also a paper on "Les Scandinaves en Amérique," by Alphonse Gagnon, which gives a meagre summary of the evidence in support of the claim of the Northmen to the prior discovery of America, and concludes by summing up in favour of the Rhode Island theory without, however, adding any new facts to the controversy.

In the Collections of the Nova Scotia Historical Society (Halifax, 1891) for 1889-91, there is a judicious paper on Vinland, with two maps, by Hon. L. G. Power, which also shows how difficult it is for any person who studies this vexed subject, to come to very definite conclusions. Mr. Power appears to believe, with Torfæus, that the Vinland of the old Norsemen was either in Labrador or Newfoundland—"the probabilities being in favour of the mainland." This writer, however, throws no new light on the question, which perplexes the most learned scholars.

Mr. Fiske, "Discovery of America," (Boston, 1892), vol. I, has judicious remarks on the Pre-Columbian Voyages.

Dr. Justin Winsor, and other eminent scholars whose names are mentioned below, only see "a too confident enthusiasm" and "incautious linguistic inferences" (See "Nar. and Crit. Hist." i. 98) in Mr. Eben Horsford's supposed discovery at Watertown, Mass., of a Norse Norumbega "with its walled docks and wharves, dam, fishery, etc." But nevertheless Mr. Horsford continues to support his theory with the same "confident enthusiasm," and not content with publishing elaborate sketches of old maps, and illustrations of the alleged discoveries on the Charles, he has actually built at his own expense an antique stone tower at the mouth of Stony Brook (a tributary of the Charles) in honour of the Norsemen and in defiance of his opponents. His principal work on the subject, in large folio, has for title: "The Defences of Norumbega and a Review of the Reconnaissances of Col. W. Higginson, Prof. H. W. Haynes, Dr. Justin Winsor, Dr. F. Parkman, and Rev. E. F. Slafter," (Boston and New York, 1891.) See also "Review of the Problem of the Northmen and the Site of Norumbega, by Professor Olson, Madison University, [another doubter], and a Reply by E. N. Horsford," (Cambridge, 1891.) See Fiske, 220, *n.*

The Voyages of the Norsemen, Biarne and Leif.

Dr. De Costa gives the following translation ("Pre-Columbian Discovery of America," etc., p. 86) of Biarne's voyage from Codex Flatöiensis, given in "Antiquitates Americanæ," p. 17:

Heriulf was the son of Bard, Heriulf's son, who was a relation of Ingolf the Landnamsman. Ingolf gave Heriulf land between Vog and Reikianess. Heriulf dwelt first at Dropstock. His wife was Thorgird, and their son was called Biarne. He was a promising young man. In his earliest youth he had a desire to go abroad, and he soon gathered property and reputation, and was by turns a year abroad and a year with his father. Biarne was soon in possession of a merchant ship of his own. The last winter (A. D. 985) while he was in Norway, Heriulf prepared to go to Greenland with Eric, and gave up his dwelling. There was a Christian man belonging to the Hebrides along with Heriulf, who composed the lay called the "Hafgerdingar Song," in which is this stave:

"May he whose hand protects so well
The simple monk in lonely cell,
And o'er the world upholds the sky,
His own blue hall, still stand me by."

Heriulf settled at Heriulfness (A. D. 985), and became a very distinguished man. Eric Red took up his abode at Brattahlid, and was in great consideration and honoured by all. These were Eric's children: Leif, Thorvald and Thorstein, and his daughter was called Freydis. She was married to a man named Thorvald, and they dwelt at Gardar, which is now a bishop's seat. She was a haughty, proud woman, and he was but a mean man. She was much given to gathering wealth. The people of Greenland were heathen at this time. Biarne came over the same summer (A. D. 985) with his ship to the strand which his father had sailed abroad from in the spring. He was much struck with the news, and would not unload his vessel. When his crew asked him what he intended to do, he replied that he was resolved to follow his old custom by taking up his winter abode with his father. "So I will steer for Greenland if ye will go with me." They one and all agreed to go with him. Biarne said, "Our voyage will be thought foolish, as none of us have been on the Greenland sea before." Nevertheless they set out to sea as soon as they were ready, and sailed for three days, until they lost sight of the land they left. But when the wind failed, a north wind with fog set in, and they knew not where they were sailing to; and this lasted many days. At last they saw the sun, and could distinguish the quarter of the sky; so they hoisted sail again, and sailed a whole day and night, when they made land. They spoke among themselves what this land could be, and Biarne said that, in his opinion, it could not be Greenland. On the question, if he should sail nearer to it, he said, "It is my advice that we sail up close to the land." They did so, and they soon saw that the land was without mountains, was covered with woods, and that there were small hills inland. They left the land on the larboard side, and had their sheet on the land side. Then they sailed two days and nights before they got sight of land again. They asked Biarne if he thought this would be Greenland; but he gave his opinion that the land was no more Greenland than the land they had seen before. "For on Greenland, it is said, there are great snow mountains." They soon came near to the land, and saw that it was flat and covered with trees. Now, as the wind fell, the ship's people talked of its being advisable to make for the land, but Biarne would not agree to it. They thought that they would need wood and water, but Biarne said, "Ye are not in want of either." The men blamed him for this. He ordered them to hoist the sail, which was done. They now turned the ship's bow from the land, and kept the sea for three days and nights, with a fine breeze from southwest. Then they saw a third land, which was high and mountainous, and with snowy mountains. Then they asked Biarne if he would land here, but he refused; "for in my opinion this land is not what we want." Now they let the sails stand and kept along the land, and saw it was an island. Then they turned from the land stood out to sea with the same breeze; but the gale increased, and Biarne ordered a reef to be taken in, and not to sail harder than the ship and her tackle could easily bear. After sailing three days and three nights, they made, the fourth time, land; and when they asked Bairne if he thought this was Greenland or not, Biarne replied: "This is most like what has been told

me of Greenland, and here we shall take to the land." They did so, and came to the land in the evening, under a ness [a cape], where they found a boat. On this ness dwelt Biarne's father, Heriulf; and from that it is called Heriulfness. Biarne went to his father's, gave up sea-faring, and after his father's death continued to dwell there when at home.

Leif's voyage is recorded in the "Flato Manuscript," and is given in "Antiquitates Americanæ," pp. 26-40. I give Dr. De Costa's excellent translation, p. 92:

(A. D. 984.) It is next to be told that Biarne Heriulfson came over from Greenland to Norway, on a visit to Earl Eric, who received him well. Biarne tells of this expedition of his, in which he had discovered unknown land; and people thought he had not been very curious to get knowledge, as he could not give any account of those countries, and he was somewhat blamed on this account. (A. D. 986.) Bairne was made a court man of the earl, and the summer after he went over to Greenland; and afterward there was much talk about discovering unknown lands. Leif, a son of Eric Red of Brattahlid, went over to Biarne Heriulfson, and bought the ship from him, and manned the vessel, so that in all there were thirty-five men on board. Leif begged his father Eric to go as commander of the expedition, but he excused himself, saying he was getting old and not so able as formerly to undergo the hardship of a sea voyage. Leif insisted that he among all their relations was the most likely to have good luck on such an expedition, and Eric consented, and rode home with Leif, when they had got all ready for sea; but as they were getting near the ship the horse on which Eric was riding stumbled, and he fell from his horse and hurt his foot. "It is destined," said Eric, "that I should never discover more lands than this of Greenland, on which we live; and now we must not run hastily into this adventure." Eric accordingly returned home to Brattahlid, but Leif, with his comrades, in all thirty-five men, rigged out their vessel. There was a man from the south country called Tyrker with the expedition. (A. D. 1000.) They put the ship in order, and went to sea when they were ready. They first came to the land which Biarne had last (first) discovered, sailed up to it, cast anchor, put out a boat and went on shore; but there was no grass to be seen. There were large snowy mountains up the country, but all the way from the sea to these snowy ridges the land was one field of snow, and it appeared to them a country of no advantages. Leif said: "It shall not be said of us, as it was of Biarne, that we did not come upon the land; for I will give the country a name, and call it Helluland, [land of flat stones]." Then they went on board again and put to sea, and found another land. They sailed in toward it, put out a boat and landed. The country was flat and overgrown with wood, and the strand far around consisted of white sand, and low toward the sea. Then Leif said, "We shall give this land a name according to its kind," and called it Markland, [Woodland.] Then they hastened on board, and put to sea again, with the wind from the northeast, and were out for two days and made land. They sailed toward it, and came to an island which lay on the north side of the land, where they disembarked to wait for good weather. There was dew upon the grass, and, having accidentally gotten some of the dew upon their hands and put it in their mouths, they thought they had never tasted anything so sweet as it was. Then they went on board and sailed into a sound that was between the island and a ness that went out northward from the land, and sailed westward past the ness. There was very shallow water in ebb tide, so that their ship lay dry, and there was a long way between their ship and the water. They were so desirous to get to the land that they would not wait till their ship floated, but ran to the land, to a place where a river comes out of a lake. As soon as their ship was afloat they took the boats, rowed to the ship, towed her up the river and from thence into the lake, where they cast anchor, carried their beds out of the ship, and set up their tents. They resolved to put things in order for wintering there, and they erected a large house. They did not want for salmon, both in the river and in the lake, and they thought the salmon larger than any they had ever seen before. The country appeared to them of so good a kind that it would not be necessary to gather fodder for the cattle in winter. There was no frost in the winter, and the grass was much withered. Day and night were more equal than in Greenland and Iceland; for on the shortest day the sun was in the sky between Eyktarstad and the Dagmalastad. Now, when they were ready with their house-building (A. D. 1001), Leif said to his fellow-travellers: "Now I will divide the crew into two divisions and explore the country. Half shall stay at home and do the work, and the other half shall search the land; but so that they do not go farther than they can come back in the evening, and that they do not wander from each other." This they continued to do for some time. Leif changed about, sometimes with them and sometimes with those at home. Leif was a stout and strong man and of manly appearance, and was, besides, a prudent and sagacious man in all respects.

It happened one evening that a man of the party was missing, and it was the south countryman Tyrker. Leif was very sorry for this, because Tyrker had long been in his father's house, and he loved Tyrker in his childhood. Leif blamed his comrades very much, and proposed to go with twelve men on an expedition to find him; but they had only gone a short way from the station when Tyrker came to meet them, and he was joyfully received. Leif soon perceived that his foster father was quite merry. Tyrker had a high forehead, sharp eyes, with a small face, and was little in size and ugly; but was very dexterous in all feats. Leif said to him, "Why art thou so late, my foster father? and why didst thou leave thy comrades?" He spoke at first long in German, rolled his eyes and knit his brows; but they could not make out what he was saying. After a while and some delay, he said in Norse, "I did not go much further than they; and yet I have something altogether new to relate, for I found vines and grapes." "Is that true, my foster father?" said Leif. "Yes, true it is," answered he, "for I was born where there was no scarcity of grapes." They slept all night, and the next morning Leif said to his men: "Now we shall have two occupations to attend to, and day about; namely, to gather grapes or cut vines, and to fell wood in the forest to lade our vessel." This advice was followed. It is related that their stern boat was filled with grapes, and then a cargo of wood was hewn for the vessel. Towards spring they made ready and sailed away, and Leif gave the country a name from its products, and called it Vinland. They now sailed into the open sea, and had a fair wind until they came in sight of Greenland and the lands below the ice mountains. Then a man put in a word and said to Leif, "Why do you steer so close to the wind?" Leif replied, "I mind my helm and tend to other things, too; do you notice anything?" They said that they saw nothing remarkable. "I do not know," said Leif, "whether I see a ship or a rock." Then they looked and saw that it was a rock. But he saw so much better than they that he discovered men upon the rock. "Now I will," said Leif, "that we hold to the wind, that we may come up to them if they should need help; and if they should not be friendly inclined, it is in our power to do as we please and not theirs." Now they sailed under the rock, lowered their sails, cast anchor, and put out another small boat which they had with them. Then Tyrker asked who their leader was. He said his name was Thorer, and said he was a Northman. "But what is your name?" said he. Leif told his name. "Are you the son of Eric the Red of Brattahlid?" he asked. Leif said that was so. "Now I will," said

Leif, "take ye and all on board my ship, and as much of the goods as the ship will store." They took up this offer, and sailed away to Ericfiord with the cargo, and from thence to Brattahlid, where they unloaded the ship. Leif offered Thorer and his wife, Gudrid, and three others lodging with himself, and offering lodging elsewhere for the rest of the people, both of Thorer's crew and his own. Leif took fifteen men from the rock, and thereafter was called Leif the Lucky. After that time Leif advanced greatly in wealth and consideration. That winter sickness came among Thorer's people, and he himself and a great part of his crew died. The same winter Eric Red died. This expedition to Vinland was much talked of, and Leif's brother, Thorvald, thought that the country had not been explored enough in different places. Then Leif said to Thorvald, "You may go, brother, in my ship to Vinland if you like; but I will first send the ship for the timber which Thorer left upon the rock." So it was done.

II. The Cabot Voyages.

Here we enter into the realm of earnest disputation, in which learned historians and archæologists broach their favourite theories. All the authorities that the writer has consulted, seem, in his opinion, to show that John Cabot first discovered America in 1497, and not in 1494, as argued by M. d'Avezac (See his letter at end of Dr. Kohl's "History of the Discovery of Maine"). The landfall of that famous voyage is still, and is likely to remain, in dispute; but as long as the Sebastian Cabot mappe monde of 1544, discovered in Germany in 1843 by Von Martius, and deposited in the National Library of Paris, is believed by many authorities on such subjects to be authentic, some point on the northeastern coast of the island of Cape Breton must be accepted as the actual "prima tierra vista" of 1497. The delineation of Cape Breton, then considered a part of the mainland or the terre des Bretons, and the position of the island of St. John, (P. E. Island) named by Cabot, and the language of the legend or inscription on the map, referring to the discovery on the 24th June, go to support the Cape Breton theory. So much depends on the legend, No. 8, that I give it entire, as it appears on the Paris map in Spanish. I may here add, for the information of the reader who has not seen a copy of the original map, that it has numerous inscriptions or legends, in Spanish and Latin—the latter presumably a translation of the former:—

"No. 8. Esta tierra fue descubierta por Ioan Caboto Veneciano, y Sebastian Caboto su hijo, anno del nascimiento de nuestro Sauluado Iesu Christo de M.CCCC. XCIIII. a ueinte y quarto de Junio por la mannana, a la qual pusieron nôbre prima tierra uista, y a una isla grâde que esta par ladha tierra, le pusieron nôbre Sant Ioan, por auer sido descubierta el mismo dia lagente della andan uestidos depieles de animales, usan en sus guerras arcos, y flechas, lancas, y dardos, y unas porras de palo, y hondas. Es terra muy steril, ay enella a muchos orsos plancos. y cieruos muy grâdes como cauollos, y otras muchas animales, y semeiantemête ay pescado infinito, sollos, salmões, lenguados, muy grandes de uara enlargo y otras muchas diversidades de pescados, y la mayor multitud dellos se dizen baccallaos, y asi mismio ay en la dha tierra Halconos prietos como cueruos Aquillas, Perdices, Pardilles, y otras muchas aues de duiersas maneras." [See *supra*, sec. I.]

It is a strong fact in support of the Sebastian Cabot claim to the authorship of this map,—of which the legends could hardly have been written by one not present at the time of the discovery—that Hakluyt reprinted for the first time in Latin, with a translation: "An extract taken out of the map of Sebastian Cabot, cut by Clement Adams, concerning his discovery of the West Indies, which is to be seene in Her Majesties privie gallerie at Westminster, and in many other ancient merchants' houses." Clement Adams is said to have been a schoolmaster by profession, not an engraver, but we have no traces of his map except the extract in Hakluyt. One learned writer (Richard Biddle, in his erudite, though badly arranged, Sabastian Cabot Memoir, Philadelphia, 1831), expresses the opinion that "the disappearance of this curious document may probably be referred, either to the sales which took place after the death of Charles I., or to the fire in the reign of William III," but it is nevertheless strange that no copy of it has come down to us from the "ancient merchants," in many of whose houses Adams declares it was to be seen in his time. That my readers may, however, see that the Latin inscription of the Adams extract—we may assume it was taken out of the map by Adams himself, from the general tenor of Hakluyt's introduction given above—is to all intents and purposes the Spanish inscription of the mappe monde, I quote it below:—

Anno Domini, 1497, Joannes Cabotus venetus et Sebastianus illius filius eam terram fecerunt perviam, quam nullus priùs adire ausus fuit, die 24 Junij, circiter horam quintam bene manè. Hanc autem appellauit Terram primùm visam, credo quod ex mari in eam partem primùm oculos iniecerat. Nam quæ ex aduerso sita est insula, eam appellauit insulam Diui Ioannis, hac opinor ratione, quod aperta fuit eo die qui est Sacer Duio Ioanni Baptistæ: Huius incolæ pelles animalium, exuuiasque ferarum pro indumentis habent, easque tanti faciunt, quanti nos vestes preciosissimas. Cùm bellum gerunt, vtuntur arcu, sagittis, hastis, spiculis, clauis ligneis et fundis. Tellus sterilis est, neque vllos fructus affert, ex quo fit, vt vrsis albo colore, et cernis inusitatæ apud nos magnitudinis referta sit: piscibus abundat, ijsque sane magnis, quales sunt lupi marini, et quos salmones vulgus appellat; soleæ autem reperiuntur tam longæ, ut vlnæ mensuram excedant. Imprimis autem magna est copia eorum piscium, quos vulgari sermone vocant Bacallaos. Gignunter in ea insula accipitres ita nigri, vt coruorum similitudinem mirum in modum exprimant, perdices autem et aquilæ sunt nigri coloris." [See Harisse, "Jean et Sebastian Cabot" (Paris, 1882) as to date, pp. 52-60, 151-6.]

The slight discrepancies between the Spanish and the Latin versions I have here given perplex students; for it would seem that if Adams had had the original map before him he would have copied the Latin version exactly

as it was in the map he cut. Dr. Deane ("Nar. and Crit. Hist. of Am.," iii. 45) supposes there may be another Cabot map yet to be discovered, or Adams may have translated from a map with a Spanish inscription only. Translators take liberties as we see even in Hakluyt's translation of the Latin text of Adams's extract, for he adds even the following words in a parenthesis at the commencement, "with an English fleet set out from Bristoll." Biddle is particularly severe on Hakluyt for such liberties ("Memoir of Sebastian Cabot," pp. 53, 54). If there was another edition of the Cabot map, with Spanish inscriptions only, then the Adams version is fully explained. Indeed, there is reason to believe there were other editions of the Cabot map (See "Nar. and Crit. Hist. of Am.," iii. 21, *n.*, where a reference is made to a map which appears to have been published in 1549, when in all probability Adams made his extract.) The whole subject, however, is involved in too many perplexities to merit dwelling on it much longer, and my chief object in referring to the matter at all here is to show that both the Spanish and the Latin versions of the legend, taken with the map itself, generally apply to the island of Cape Breton. It is, however, the Spanish legend which, read as a whole, is the best evidence in favour of the Cape Breton claim to have been the first discovered land. Adams's Latin version appears to describe the inhabitants of the island, St. John, over against prima tierra vista, rather than the first discovered land itself, and Hakluyt's English translation is to the same effect. It is not probable that Cabot in the inscription meant to ignore prima tierra vista, and give undue prominence to the island. Adams here obviously shows he must have carelessly translated the Spanish inscription, supposing he had only that in his possession, or he may have been a slovenly copyist of some map in his possession. It does not appear that Hakluyt and Purchas both of whom quote it, ever saw the Cabot map, but only gave the extract as made by Adams. The Spanish version I have given above from the mappe monde of 1544 makes the whole matter more intelligible since the references are clearly to the inhabitants and natural products of the first seen land itself. In Adams's extract, a period on the fourth line (see extract above) instead of a colon after "Ioanni Baptistæ" would easily make "Hujus incolæ pelles animalium etc.," refer to the prima tierra vista; but we are again met in the tenth line (see above) by the use of "ea insula," which would seem to show that in this version the natural characteristics of the island are alone described. In the Spanish legend, on the other hand, we find "en la dha tierra," "in the same land"—obviously prima tierra vista—and not "in that island" as in the Adams extract. Elsewhere I have stated my belief that the northern part of Cape Breton is the prima tierra vista (*supra*, sec. I.) The Scatari theory would be quite justified by the description in the legend, and the course a navigator would probably take from Bristol to the southern entrance of the Gulf of St. Lawrence, but the defined position of St. John's island in the mappe monde is against the theory. If we accept Sebastian Cabot as the map-maker then he could not have misplaced the island "que esta par la dha tierra." Richard Biddle, who was the first scholar sixty years ago, to write learnedly on the Cabot Voyages, chiefly as an eulogist of Sebastian, supported his contention in favour of Labrador as prima tierra vista by the supposed existence of an island of St. John in the latitude of 56° immediately on the coast of Labrador; but the discovery of the mappe monde is fatal to his theory, which had no authority except a doubtful map of Ortelius borrowed from Mercator (See Deane in "Nar. and Crit. of Am.," iii. 34). If we could reject the supposed mappe monde of Sebastian Cabot as a mere fabrication—as an attempt to reproduce a map shown by Clement Adams to have had an existence in his time,—then Scatari might with considerable reason be given as the island seen over against the landfall in 1497. The maker of a spurious map, in later times, knowing of the existence of an island of St. John in the Gulf would probably indicate it as the prima tierra vista. On these and the various other perplexing questions that surround the whole subject I refer the reader to the following most recent writings :—

"The Voyages of the Cabots," with a critical essay in the "Nar. and Crit. Hist. of Am.," (iii. 1-58), by Charles Deane, LL.D., an authority on American history and archæology. All the important works on the subject are here cited with critical acumen. Dr. Deane believes that the weight of evidence is in favour of the authenticity of the map, and that there is no good reason for not accepting the northern part of Cape Breton as Cabot's landfall.

"Jean Cabot," in Le Canada Français for October, 1888, (University of Laval, Quebec) by the Abbé J. D. Beaudoin, one of those learned men like Ferland, Casgrain, Hamel, and Cuoq, that the Roman Catholic Church of Canada can claim among its teachers. He goes over the ground travelled by all writers on the subject, and combats the arguments of Biddle, and other supporters of the Labrador theory. He comes to the conclusion that it is difficult to deny the authenticity of the Sebastian Cabot map, and that "there is no reason not to accept the northern part of Cape Breton as tierra primùm vista." But one cannot agree with the Abbé when he goes so far as to construe the legend respecting Cape Breton on a Portolano map of 1520 or 1514—Terra que foj descuberta por Bertomes—as referring to the English (Breton) discovery under Cabot, and not to the generally recognized claim of the French Bretons to have given their name first to the island and the adjacent country. As to the white bears seen by the voyagers he believes, with reason, they might have existed in 1497 in northern Cape Breton.

Harrisse (Cabots, 65, 85) favours Cape Percé (old name of north head of Cow Bay), but he himself effectively disposes of this theory by stating it is 129 miles distant from Prince Edward Island.

"The Landfall of Cabot," in the 'Transactions of the Geographical Society of Quebec' for 1888, (published for 1886-87-88-89 in one volume in 1889), by James R. Howley, F. G. S., of Newfoundland. It was written mainly to refute the theory raised by Professor Eben Horsford in a letter to the American Geographical Society (Bulletin No. 2, for 1885, N. Y.), that the site of the landfall was Salem Neck, in 42°, 32n. lat., and that the town of Norumbegue was on the Charles River. This theory, in his opinion, shows how the imaginative faculty can be stretched on questions on which the evidence is doubtful, and there is room for much disputation. Mr. Howley gives his view in favour of Labrador, but he admits that the presence of the words "prima tierra vista" on the coast of Cape Breton "is a difficult question to dispose of," and all he can conclude at last after the usual assumptions and attempted applications of old and never reliable maps to the subject of controversy is that, though he does "not pretend to have established the fact, that Cabot's actual landfall in 1497 could be no other land than some part of the Labrador coast, yet the foregoing evidence tends greatly towards that conclusion." Most students (see *supra*, App. I.) agree with him when he says that "at all events it must be conceded that the grounds upon which that supposition is placed, are certainly of a more promising character than those which Mr. Horsford brings forward to establish his theory for Salem Neck and Cape Ann."

"Cabot's Landfall," in the 'Magazine of American History' for October, 1891, by the Very Reverend M. F. Howley, DD., a Roman Catholic clergyman of Newfoundland. Here a scholarly dignitary comes to the rescue of Bonavista or Cape St. John, on the eastern coast of Newfoundland, as the site of the famous discovery of 1497, "in whose favour," in his opinion, "there still remains a strong presumption," despite the strength of the evidence for Labrador. It is impossible, of course, to follow the writer in his disquisition, which, as usual, shows all the anxiety to make old authors and maps—not a difficult task when we consider their vagueness—harmonize with his assumptions. He, like all others, cannot surmount the difficulty of the words "prima tierra vista" on the delineation of Cape Breton, and is consequently obliged to fall back on the only possible way of getting out of the difficulty, by supposing that some person, not knowing much about Spanish, inserted the words on the map. But the fact that the words "prima tierra vista" on the north of Cape Breton, corresponds *verbatim et literatim* with the inscription on the sides,—an inscription, as much a part of the map as the delineation itself of the coasts and their names—shows that they were written on the same authority, if not by the same person, obviously Sebastian Cabot who alone could know the facts. Dr. Howley is not always remarkably accurate in his statements, in discussing a subject on which one should attempt to follow the exact wording of the authorities, or evidence, on which the whole argument is necessarily based. For instance, he says that "Cabot is supposed to have sighted land at Cape North, *and at the same time*, [the italics are mine] or shortly after, to have seen this island off the coast, insula quæ ex adverso est, an island *just alongside*, en face ou tout à côté." These are the observations he makes before going on to advance his opinion that Cabot could not have sighted P. E. Island or St. John on the same day he made Cape North. But, in the first place, "ex adverso," properly translated (See any good Latin-English dictionary, like 'Andrews),' is "over against," and not alongside. In 'Hakluyt's not very accurate translation of Adams's extract, it is given, not alongside, but "that island which lieth out before the land." More than that, Dr. Howley could not have consulted either Adams's extract or the inscriptions on the mappe monde, when he writes of the island being discovered "at the same time." Adams's extract gives the discovery of prima tierra vista at five o'clock in the morning, and of the island on the same day and not at the same time or hour. The Latin inscription on the mappe monde of 1544, is "hora 5, sub. diluculo," ("Nar. and Crit. Hist. of Am.," iii. 21, *n.*) which agrees with Adams.

The Spanish inscription refers to the first land being seen in the morning simply, without giving the hour—a discrepancy which a mere fabricator of the map and its inscriptions would be anxious to avoid, if he desired to deceive the world. It is clear, at any rate, that the discovery was early in the morning, at a time of the year, when the daylight is longest—over 15 hours in that latitude,—and it was therefore quite possible for Cabot, with a strong favouring breeze, to have sighted P. E. Island before darkness set in on the same day he discovered the northern part of Cape Breton. Indeed, the inscription is clearly very general in its scope, and was written many years after the discovery, but such as it is, it sufficiently explains the respective positions of prima tierra vista, and of the island which the navigators next saw on the same day. One is inclined to doubt Dr. Howley's care in consulting authorities, when he tells us in another place that Cartier discovered and named St. Paul's island, "le Cap de Saint Paul." The relation of the second voyage to which I refer fully below, (See *infra*, App. VII.) does not speak of an island at all, but only of some cape clearly to the south of Cape North or Cape St. Lawrence. It is such mere generalizations, and careless references to the authorities that mar an otherwise scholarly article, and leads us to ask, whether in his zeal to make his point he does not at times inadvertently mislead his readers.

In the "Nar. and Crit. Hist. of Am." (iii. 23; iv. 84) there are copies of a part of the Sebastian Cabot mappe monde. A still clearer copy for consultation on the questions at issue, is given in the "Discovery of North America" (p. 358) by Dr. Kohl, who endeavored to show how utterly impossible it is, that it was either drawn by Sebastian

Cabot, or executed under his direction or superintendence, (pp. 385-377) but even this learned man concludes by saying that he does "not pretend to speak decisively on the subject"—that the landfall was not Cape Breton. The weight of his argument goes to show that the year of discovery must have been 1497, and not 1494, as urged by M. d'Avezac in the Appendix to the same work (pp. 502-514) in support of the claim for the latter year, which he had elaborately pressed for many years (See "Bulletin de la Societé de Géographie" of Paris, Oct. 1857, Note K, pp. 266-278). It now appears to be the opinion of scholars generally, that the two voyages were in 1497 and 1498. The French Geographer, M. Jomard, who procured the mappe monde for the imperial library at Paris, on its discovery in Germany, has given a facsimile of it in his elaborate work, "Les Monuments de la Géographie," (Paris, 1854-56) but it does not contain the inscriptions. Other sketches are given in Bryant and Gay's "United States" (i. 193); Judge Daly's "Early History of Cartography" (New York, 1879); Julian de la Gravière's "Les Marins du Quinzième et du Sixième Siecle" (Paris, 1879), and an essay on the subject, also published in the "Revue des deux Mondes" for 1876. In Dr. Justin Winsor's "Christopher Columbus," (Boston, 1891) there is also a sketch of the map, (p. 626). See "Nar. and Crit. Hist. of Am.," (iii. 21, *n.*) for other references to copies of the map of which I give a sketch in the text of this work. One of the best copies (coloured) is in Harrisse's Cabots.

In an article by G. Dexter, Recording Secretary of the Mass. Hist. Soc., in the "Mem. Hist. of Boston," (i. 30, *n.*) on "Early European Voyages in Mass. Bay," he says "the best evidence points to Cape Breton," and cites in this connection J. C. Brevoort's 'Hist. Mag.,' March, 1868; F. Kidder, 'N. E. Hist. and Gen. Reg.,' Oct., 1878; H. Stevens, "Sebastian Cabot—John Cabot, = O," and Mr. Deane's paper on Cabot's "Mappe Monde" in the 'Proc. of the Am. Antiq. Soc.,' for April, 1867, "where the earliest suggestion of Cape Breton (drawn from the map) is made."

Mr. Goldsmid of Edinburgh, (See *infra*, App. VIII 3,) in his addition of "Hakluyt," refers to a facsimile of a part of the map, (facing page 23, vol xii) and adds: "As will be seen the words 'Prima Tierra Vista' are opposite a Cape about the 48th. parallel, which would be Cape Breton. In a letter written to the Duke of Milan, by Raimondo de Soncino, his minister in London, and dated the 18th Dec. 1497, a very interesting account is given of Cabot's voyage. Archives of Milan. Annuario scientifico, Milan, 1866, p. 700." This letter, which is cited in full by Dr. Deane, in "Nar. and Crit. Hist of Am.," (iii. 54-55) "throws no light on the landfall," though it is sufficient "to show [the words quoted are Dr. Deane's] that North America was discovered by John Cabot, and that the discovery was made in 1497." None of the copies of the Goldsmid ed. of "Hakluyt" I have seen contain the map referred to above.

III. The Portuguese Voyages.

The critical essay on sources of information, at end of the essay on "Cortereal, Verrazzano, Gomez, and Thevet" by George Dexter, in the "Nar. and Crit. Hist. of Am." (iv. 1-32) gives the authorities on the Cortereal voyages, but since that work was printed the Reverend George Patterson, DD., F. R. S. C., has written an exhaustive monograph on "The Portuguese on the northeast coast of America, and the first European attempt at colonization there. A lost chapter in American History" ('Trans. Roy. Soc. Canada,' viii. sec. 2, art. 4; also 'Mag. of Am. Hist.' April, 1891). It is illustrated by various maps, to support his claim that the Portuguese explored not only the coasts of Labrador and Newfoundland but the shores of Cape Breton, Nova Scotia and the adjacent lands. Among other facts he refers (p. 150) to the Portuguese origin of the name, Baya Funda, or Deep Bay, which the French attempted to change to Baie Française. He believes in the existence of a Portuguese colony at St. Peter's, Cape Breton, and not at Inganiche as stated by Champlain; (see *infra*, App. VIII. 4) but he adduces no evidence to make converts to this theory, however plausible. One can, however, fully agree with his general conclusion (p. 171) that "this people occupied a foremost place in the exploration of this part of the continent, and for a long time had a commanding influence along its shores. Portuguese influence in this quarter has passed away as an exhalation of the night and a few names are all that remain to tell of their former presence." Dr. Patterson has long been known for the ability and research he brings to archæological and historical work, and is among the Canadian pioneers of this class of study. He is a resident of Pictou Co., N. S., of which district he has written a history (Montreal, 1877, 8vo. pp. 471). See De Souza, "Tratado das Ilhas Novas," (1877) p. 5. See also Mr. R. G. Haliburton's remarks on the same subject in 'Popular Science Monthly' for May, 1885, pp. 46-50. He also refers, in the same article (pp. 50-51) to a probable Spanish settlement at Sydney.

IV. Norumbega.

On the subject of the indefinite region known as Norumbega, the reader may consult Rev. Dr. DeCosta's article and critical notes in "Nar. and Crit. Hist. of Am.," v., c. 6, pp. 168-218; also, DeKohl, "Discovery of N. A.," 35, 205, 230, 231, 235, 283, 304, 353, 420, 489. Dr. DeCosta's learned paper gives much information, and many authorities bearing on this interesting subject of archæological research.

Aranbega, or Norumbega, or Norumbegue, or Terra de Norembega, or Norembeque or Norumbec is a name known only in the dawn of geographical knowledge in America. In the map of Hieronimus de Verazzano (1529) the district of Aranbega is a definite and "apparently unimportant locality." The great French captain whom Ramusio cites (See *infra*, App. VI.) refers as early as 1539 to the Indian name Norumbega as including La Terre Française or the French country discovered by Verazzano, and the present State of Maine, and extending in its entirety over a vast region from Cape Breton to Florida. In later times it was confined to the territory watered by the Penobscot, and some imaginative intellects eventually built a fine city of crystal and silver on the banks of that noble river. Arambec or Arembec—another form probably of the same name—appears to have been confined to Nova Scotia. John Rut in 1527 is said to have sailed towards Cape Breton and the coasts of Arembec. It is quite clear that in the indefinite geography of the sixteenth century the northeastern limit of Norumbega or Norumbegue was Cape Breton. The meaning of the word has perplexed all the geographical antiquarians who have devoted themselves to its study. It is believed to be Indian, but others contend even for a Scandinavian origin—a relic of the Northern voyagers. (See *supra* sec. IX) It is most likely a survival of an old word in use among the tribes of the Algonquin family that inhabit Maine and the Maritime provinces of Canada. The Micmacs of Cape Breton and Abenakis of Maine show in their respective languages some evidences of their common origin. Bedabadec which was the Indian name given to a locality at the entrance of the river Penobscot and to the Camden Hills in Maine (See "Champlain," ii. 180-181) is obviously akin to Bedec on the Bras d'Or. The Abbé Maurault in his "History of the Abenakis" (Sorel, Prov. of Quebec, 1866) enumerates the seven tribes in Maine, New Hampshire and New Brunswick that composed the Abenakis, but leaves out the Micmacs on the ground that their language was different. But such words as Masquacook (Maskgateku), meaning a river with plenty of bark, has the Micmac affix—Maskive, the general name for bark. The Micmac adjective, Sakskae, flat, is also to be traced in the Abenaqui word, Skkadagk, (the Sagadahock), the place where the ground is flat and continuous. It is quite probable that Norambec, Lorambec (in Cape Breton) and Arambec are memorials of an Algonquin word which was in common use among the several tribes of the Algonquin family of Indians in northeastern America as the name of the region extending from Cape Breton to beyond the Kennebec river.

V. Baccalaos on the Old Maps.

The ancient name of Baccalaos, like that of Terre des Bretons, seemed likely for many years of the early history of this continent to fix itself permanently to a considerable section of eastern America. In the Ruysch map (1508), it appears for the first time as an eastern projection of the old continent of Asia, as a cape or island called Baccalaurus. In Reinel's map (1504 or 1505), it is applied to an island Y dos Bocalhos. In the Portuguese Portalano map (1514–1520) Bacalnaos is given to the eastern coast of Newfoundland. Kohl ("Dis. of N. A.," 179) considers it comprises Newfoundland, Labrador and Nova Scotia. In Ribero's map (1529) Ta de Baccallaos is the designation of an irregular peninsula in eastern America. In Orontius Fine's globe (1531) Baccalar is applied to the peninsula of Acadia. In Lazaro Luiz's map (1531) Bacalhaos is an islet off the east coast of Newfoundland, and the same occurs in Hieronymus Verazzano (1529) where it appears as Backaliaio—another illustration of its variable orthography. In Carta Marina (1548) it is given to the eastern part of British America south of Labrador. In Mercator's map (1538) Baccalearum regio is clearly Canada. In De Laet's map, it is the name of a small island off eastern Newfoundland. On Ulpius's globe (1542) Baccalearum regio is the designation of Canada. In the Frere map (1546) dos Baquaelthaos is an island off Newfoundland. In Gastaldi's map (1548) Tierra del Baccalaos is an indefinite region north of Norumbega or Nova Scotia, and west of Labrador,—obviously old Canada. The name of Los Baccalaos appears prominently in the Historia General de las Indias (1552) by Gomara, one of the most distinguished writers of Spain. In the Ramusio Gastaldi map (1550) it is applied to the southern part of Newfoundland. In Mercator's map (1569) it is given to the latter island. In Martines's (1578) it becomes a region south of Labrador, and obviously the later Acadia. In Wytfleit's (1597) it represents Newfoundland and Labrador. In Judæis's (1593) it is Newfoundland and it is the same in Quadus (1600). In About's (1610) Newfoundland is Terre neuve, and Baccalaos is given to a portion of eastern America, west of Accadie, now designated by its Indian name. In L'Escarbot's map (1609) Cape Breton becomes Baccalaos. From that time it disappears from the maps of the mainland of eastern America, and is confined to the small islet off the Bay of Conception on the east coast of Newfoundland, and to a point, Cape Baccaro, on the northwestern coast of Nova Scotia. The last mention we find of this ancient historic name in official documents is in the grant made in 1621 to Sir William Alexander of Nova Scotia, and here it still clings to the island of Cape Breton. These references to the old cartography of eastern America show, beyond dispute, that the name was of early application to this continent. Its origin is still a matter of controversy, but the weight of evidence appears decidedly on the side of the Basque theory. Doubt is thrown, however, on the statement of Peter Martyr ("De Orbe Novo" dec. iii., ch. 6) that John Cabot introduced the name,

which he found in use among the natives for "codfish." (See Kohl "Doc. Hist. of Maine," 188-189-481). Be that as it may there is every reason to believe that the Basques and Bretons ventured into American waters during times of which we have no record, and it is quite certain that Baccalaos is a word long used for codfish among the people on the Bay of Biscay and that it lingers still in the Spanish language, probably an inheritance from the Basques. L'Escarbot is of opinion "il est de l'imposition de nos Basques lesquels appellent une morüe, Bacaillos," (i. 237). He adds that the proper name of the codfish in the Indian tongue is "apege,"—which is obviously the present Micmac word, "pegoo" (See Rand's "Micmac Dict"). Kohl is a strong advocate for the German origin of the term—the root of the word being, according to him, the Germanic "bolch" meaning fish. In his opinion the Portuguese fishermen originated the term tiera de Bacalhas, the stock-fish country, which eventually assumed the Spanish form Baccallaos "Doc. Hist. of Maine, 188, 189 and *n*. But see Harrisse's Cabots, 75. The "Nar. and Crit. Hist. of Am." (vol. iii, especially p. 12, note 2) gives references to the various theories on the origin of the name, and after studying the opinions and considering all the testimony adduced on all sides, one must come to the conclusion the Basques can claim to have been among the earliest discoverers of eastern America.

VI. Cartography of Cape Breton, 1527–1632.

Oviedo ("Historia de las Indias, ii. 148) who gives a description of the eastern coast of America in 1537 shows no knowledge of the gulf but he refers to the four coasts of Cape Breton Island. In the Maiollo map (1527) the cape (c. de berton) is laid down quite distinctly. In Ribero's (1529) the terra de Breto is the mainland. In Rotz's map (1542) Cabo Bretos is a large island with a long narrow strait between it and the main land. On the Ulpius globe Cavo de brettoni is defined. In the alleged Sebastian Cabot mappe monde (1544) J. Cabot's landfall is given as the eastern cape of the mainland, but there is an island to the south named del berto. In Allefonsce's sketches (1544-5) the island is well delineated. In Henri II map (1546) Terre des Bretons is given to the country afterwards known as Acadie and cap aux Bretons is represented by a small island off the coast. In the Freire map (1546) C. Bretain is the southerly cape of the mainland, and the same happens in the Nic. Vallard's (of Dieppe) the exact date of which is uncertain. In the Gastaldi map (probably 1550) Cape Breton is an island off the mainland of the Tierra de los broton. In Jomard's (attributed to between 1550 and 1560) C. Breton is a southerly point of a small narrow island off the eastern mainland In the Baptista Agnese map (1554) terra de los bertoms is on the mainland south of Terra de Bacalaos. In Bellero's map (1554) C. Breton is a cape of the mainland. In Munster's (1540) C. Britonum is a cape of the continent and Cortereal is given to an island, probably the present Cape Breton. In Homen's, the Portuguese map-maker, (1558) C. dos bertoens is obviously Cape Breton, but no island is delineated. In Ruscelli's C. Breton is delineated off the eastern coast of Tierra de los Breton. In Zaltieri's (1556) Cape Breton is a small island to the south of terra de baccalaos, clearly the present maritime provinces of Canada. In Nicholas des Liens's (1556) cap aux Bretons is given to a long irregular peninsula to the south of Terra de Labrador, and to the northeast of Nouvelle France which appears to include the present Eastern States. In Mercator's (1569) Cap de Breton is an island off the mainland of Norombega or Nova Scotia. In Ortelius's (1570, Cape Breton is not named, but the map is evidently a reproduction of the former, and the island appears off Norumbega. In Porcacchi's (1572) the delineations are even less correct, and Cape Berton is an insignificant island off the southern coast of Terra del Laborador. Larcadia and Canada are both mentioned. In Judæis's (1593) C. de brito is a mere spot off the mainland the configuration of which shows an enlarged geographical knowledge of the coasts. In De Bry's (1596) C. de Bertam is an island, fairly delineated for those days, off Nova Francia and Norombega. In Wyfliet's (1597) "Nova Francia et Canada," there is a large island off the eastern coast, an excellent if rude delineation of the present Cape Breton but the cape is not accurately placed as it is given to the mainland. In Quadus's (1600) C. de Breton is a small island off Norombega. From that date there is a new interest taken in the exploration of eastern America, and the maps of Champlain commence a new era in the cartography of Cape Breton. The reader who wishes to study the ancient geography of the Gulf of St. Lawrence will find illustrations of the maps, cited above, and a great deal of critical knowledge on the subject, in the "Nar. and Crit. Hist.," vol. iv. Excellent representations of many of the old maps are also given in Dr. Kohl's Documentary History of Maine. Mr. Ganong, in the paper mentioned on the following page, reproduces a number of these maps, and gives a learned dissertation on the subject well worthy of attention. It is interesting to note how nearly the adventurous Bretons succeeded in establishing their name on a considerable portion of Eastern America, including the present island.

The advocates of the Basque claim to the prior discovery and the naming of Cape Breton may urge in their favour the fact that the name of its cape is that of a headland in the bay of Biscay, in a district originally inhabited by a Basque population. On the other hand, in support of the Breton claim, there are the numerous maps, to which I have already referred, which seem to substantiate the fact that the cape was really named the Breton cape or the

cape of the Bretons. The Italian Ramusio, in his well known collection of voyages, (Raccolta, 1556, iii. 359) gives a discourse of a gran capitano francese, generally known to be Jean Parmentier of Dieppe, and written in 1539, in which the Bretons and Normans are mentioned as having frequented the northern parts of America thirty-five years before (probably in 1504) and to have named the now famous cape of the island of Cape Breton. The best evidence is adduced to show that Jean Denys of Honfleur, and pilot Gomart of Rouen visited the gulf in 1606 and Thomas Aubert of Dieppe in the Pensée two years later. Gosselin (Documents, etc. 13) gives a list of several vessels that made voyages to Newfoundland and the Gulf in 1508. Mr. De Costa, referring to these cumulative facts in favour of the Breton claim, says, with obvious force, "how poor is the appearance of that scepticism which has so long led visitors to look askance at the statements of Ramusio concerning Aubert and the Pensée." See "Nar. & Crit. Hist. of Am.," iv. 63, 64 *n*. A number of authorities are there cited in support of the Breton claim. Consult also pp. 3, *n*, of the same volume; Forster, "Northern Voyages," book iii. cc. ii, iv; Estancelin, "Navigateurs Normands," (Paris, 1832) 216, 240; Parkman, "Pioneers of France in the New World," 170-174, and notes especially; Justin Winsor, "Columbus," 555-556. In the Portuguese Portolano map, 1514 or 1520, we find added to Nova Scotia and the island of Cape Breton the Portuguese inscription "terra que foj descuberta por bertomes" (land discovered by the Bretons) "Nar. & Crit. Hist of Am.," iii. 56. See also Kohl, "Doc. Hist of Maine," 201-205, 179-181. This map is a strong confirmation of the claim that Cape Breton was discovered by the Bretons before the Portuguese themselves visited the island. See Harrisse's Cabots, 271.

VII. Jacques Cartier off Cape Breton.

Cartier appears on his return to Europe during his second voyage (1535-6) to have been within sight of the northern coast of Cape Breton. One of these capes was Cape Loreine—which, one account says, he named—and the other to the south of the former he called St. Paules. Much speculation has arisen whether cape Loreine was Cape St. Lawrence or Cape North. Mr. Ganong in a carefully studied paper on the cartography of the St. Lawrence '(Trans. Roy. Soc. Can.,' vii. sec. 2) believes from the similarity of names, that Loreine was the present St. Lawrence, but on the other hand, Mr. Pope, in his excellent monograph on Jacques Cartier (Ottawa, 1889, pp. 109, 110.) is an advocate of the claim of Cape North. Browe, on the other hand, ("Hist. of Cape Breton," p. 30) states that Cape Loreine was Cape Ray, in Newfoundland, and St. Paul's cape, Cape North, in Cape Breton Island. On Maiollo's map (1527) there is a rio de San Paulo near Cap de Bertoni, and also a c. de San Paulo delineated. In the Viegas map (1534) we see a San Paulo, on the western side of the gut of Canso, and Kohl (Doc. Hist. of Maine, 349, 350) is of opinion that "S. Paulo is a name often met with on the east coast of Cape Breton," and that "Cartier only adopted and confirmed the name previously given." Kohl also states, what is evident, that S. Paulo, though appearing on the eastern coast of Nova Scotia, was "written by the map-maker on the place where it stands, because there was more room for it than in the place where it belongs." Commenting on these maps, Ganong points out that Cape S. Paulo in Maiollo's map is really in Newfoundland and a river St. Paul is given to Cape Breton. He does not seem to agree with the conclusion to which Kohl comes why St. Paulo appears on the mainland, though it is reasonable and likely. Ganong also believes that St. Paul's Cape was the present St. Paul's Island. That my readers may see the difficulties surrounding the question I give the three following versions of Cartier's second voyage, so far as they relate to northern Cape Breton.

I.—From Hakluyt, Navigations, America (Part ii), vol. xiii., Goldsmid's Edition (Edinburgh, 1889) pp. 142, 143.

"Vpon Thursday being the twenty-sixe of the moneth, and the feast of the Ascension of our Lord, we coasted ouer to a land and shallow of lowe sandes, which are about eight leagues Southwest from Brions Island, aboue which are large Champaignes, full of trees and also an enclosed sea, whereas we could neither see, nor perceiue any gappe or way to enter thereinto. On Friday following, being the 27 of the moneth, because the wind did change on the coast, we came to Brion's Island againe, where we stayed till the beginning of Iune, and toward the Southeast of this Island, wee sawe a lande, seeming vnto vs an Island, we coasted it about two leagues and a halfe and by the way we had notice of three other high Islands, lying toward the Sands: after wee had knowen these things we returned to the Cape of the sayd land, which doeth diuide itselfe into two or three very high Capes: the waters there are very deepe, and the flood of the sea runneth so swift, that it cannot possibly be swifter. That day we came to Cape Loreine, which is in forty-seuen degrees and a halfe toward the South: on which Cape there is a low land, and it seemeth that there is some entrance of a riuer, but there is no hauen of any worth. Aboue these lands we saw another cape towards the south we named it Saint Paules Cape, it is at 47 degrees and a quarter.

"The Sunday following, being the fourth of Iune, and Whitsunday, wee had notice of the coast lying Eastsoutheast, distant from the Newfoundland about two and twenty leagues: and because the wind was against vs, we went to a Hauen, which wee named S. Spiritus Porte, where we stayed till Tewsday that we departed thence, sayling along that coast vntil we came to Saint-Peters Islands. Wee found along the sayd coast many very dangerous Islands and shelues, which lye all in the Eastsoutheast and Westnorthwest, about three and twenty

leagues into the sea. Whilest we were in the sayd Saint-Peters Islands we met with many ships of France and of Britaine.

II.—From the copy published by the Quebec Literary and Historical Society in 1843. It is a reprint of one of three manuscripts, in the royal library of Paris:

"Le Jeudi, vingt-cinquième jour du dit mois, jour et feste de l'Ascension de Nostre Seigneur, nous traversâmes à une terre et sillon de basses araines, qui demeurent au Su-Ouest de la dite *Isle de Brion* environ huit lieues, parsus lesquelles y a de grosses terres pleines d'arbres; et y a une mer enclose, dont nous n'avons veu aucune entrée ni ouverture par où entre icelle mer.

"Et le Vendredi, vingt-sixième, parceque le vent changeoit à la coste, retournasmes à la dite *Isle de Brion*, où fusmes jusqu'au premier jour de Juin, et vinmes quérir une terre haute qui demeure au Su-Est de la dite Isle, qui nous apparoissoit estre une Isle, et la rengeames environ deux lieuës et demie, faisans lequel chemin, eumes connoissance de trois autres Isles qui demeuroient vers les araines; et pareillement les dites araines estre Isle, et la dite terre qui est terre haulte et unie estre terre certaine se rabattant au Nor-Ouest. Après lesquelles choses conneues retournasmes au Cap de la dite terre qui se fait à deux ou trois Caps hauts à merveille et grand profond d'eau, et la marée si courante, qu'il n'est possible de plus. Nous nommasmes celui cap le *Cap de Lorraine* qui est en quarante-six degrés et demi. Au Su duquel Cap y a une basse terre, et semblant d'entrée de rivière: mais il n'y a hable qui vaille, parsus lesquelles vers le Su, demeure un Cap que nous nommasmes le *Cap Sainct Paul*, qui est en quarante-sept degrés un quart.

"Le Dimanche, troisième jour du dit mois, jour et feste de la Pentecoste, eumes connoissance de la côte d'Est Su-Est de Terre-Neuve, estant à vingt-deux lieuës du dit Cap. Et pour ce que le vent estoit contraire, fusmes à un hable, que nous nommasmes le *Hable du Saint Esprit*, jusques au Mardi qu'appareillasmes du dit Hable et reconneumes la dite côte jusques aux *Isles de Sainct Pierre*. Lequel chemin faisans, tournasmes le long de la dite côte plusieurs Isles et basses fort dangereuses estant en la route d'Est Su-Est, et Ouest Nor-Ouest, à deux, trois et quatre lieuës à la mer. Nous fusmes aux dites *Isles Saint Pierre*, où trouvasmes plusieurs Navires tant de France que de Bretagne."

III.—From the Edition Originale rarissime de 1545, reprinted by Tross in 1863, Paris, with a learned preface and notes by M. d'Avezac.

"Le ieudi 26, iour dudict moys, iour et feste de l'ascétion nostre Seigneur, nous traversasmes à vne terre et sablō de basses araynes, qui demeurent au Suronaist de ladicte ysle de Bryon environ huict lieues. Pardessus lesquelles y a de grosses terres plaines d'arbres et y a une mer enclose dont n'auons veu aucune entrée ny ouverture pour entrer en icelle. Et le vendredy, 27, parce que le vent changeoit à la coste, retournasmes à ladicte ysle de Bryon, ou feusmes iusques au premier iour de Iuing et vinsmes quérir vne terre haulte qui demeure au Suest de ladicte ysle, qui nous apparoissoit estre vne ysle, et la rengeasmes environ deux lieues et demye, faisant lequel chemin eusmes congnoissance de trois haultes ysles qui demeurent vers les Araynes. Après lesquelles choses congneuses retournasmes au cap de ladicte terre qui se faict à deux ou trois caps haultz à merueilles, et grand parfond d'eaue et la marée si courante, qu'il n'est possible de plus.

"Nous arriuasmes celluy iour au cap de Lorraine, qui est en 46 degrez ½ au Su, duquel cap y a vne basse terre et semblant d'entrée de rivière: mais il n'y a hable que vaille. Parsus lesquelles terres vers le Su, veismes vng aultre cap de terre que nous nommasmes le cap de Sainct Paul, qui est en 47 degrez ¼.

"Le dimenche, 4 iour dudict moys, iour et feste de la Pentecouste, feumes congnoissance de la coste Dest Suest de terre neufue, qui estoit à enuiron vingt-deux lieues du cap, et pource que le vent estoit contraire, feusmes a vng hable que nous nommasmes le hable de sainct esperit, iusques au mardi que appareillasmes dudict hable et rengeasmes ladicte coste iusques aux ysles Saint Pierre, lequel chemin faisant trouuasmes le long de ladicte coste plusieurs ysles et basses fort dangereufes estans en la routte Dest, Suest et Ouaist, Noronaist à vne, vingt-trois lieues à la mer. Nous feusmes esdictes ysles sainct Pierre, ou trouuasmes plusieurs nauires, tant de France que de Bretaigne."

These three versions of the conclusion of Cartier's second voyage vary in minute details, which become important, when we endeavour to indicate the exact course taken by the adventurous sailor of St Malo. On the whole, narrative No. 2, published by the Quebec Hist. & Lit. Soc., appears the best for forming a conclusion on the points at issue. At least, one with a knowledge of the northern coast of Cape Breton, can identify some of the leading features of the gulf and island referred to in the account. Brion's Island still bears the same name, and the islands lying towards the sands appear to be the Magdalens, which have many sand-flats around them. Cape Breton lies to the south-east of Brion and the Magdalens. The northern part of Cape Breton is divided into several lofty heights, one of which is remarkable for its sugar-loaf aspect. Indeed, approaching this grand coast from the northwest, there is an appearance of three capes, one of which, however, disappears as we draw close to the land. The headland Cartier saw, was, no doubt, the present North Cape. The water is remarkably deep, and the currents powerful to the north of Cape Breton, especially when the winds sweep up through the Gut of Canseau. The low land Cartier saw to the south of Cape Loreine, was probably the neck which connects Cape North with the main. No harbours of importance are found on the coast, until we get to St. Anne's noble bay. The voyagers may have mistaken the many barachois, or salt water ponds, that are distinguishing features of Aspé Bay, immediately south of the northern promontory, for the mouth of a river. The cape towards the south of Loreine, was in all likelihood, one on the east coast of Cape Breton. Versions 2 and 3, agree as to the degrees of latitude, but not with those in Hakluyt. If we accept the latter as approximately correct, and make due allowances for the relatively inaccurate marine observations of those days, we may conclude that Cape St. Paules may have been the headland known as Aspé, or Egmont,—the southern promontory of Aspé Bay. A foot note to the second version by the editor, gives

this cape as probable. But the distance between the two capes of Cartier, would make it a cape further to the south, and it may have been the cloud-wrapped height of Cape Enfumé, one of the most prominent points of Cape Breton, visible for thirty and forty miles from sea on a clear day. All depends on the exact position of Cartier's vessel at the time he sighted the second cape, but the data before us are too vague to enable us to speak positively. The degrees of latitude given in the French versions, we cite above, are not reconcilable with the course Cartier took on leaving the Magdalens. Discrepancies, no doubt, crept into the various accounts of the voyages, and it is only by careful comparison of one with the other, that we can make the data of the narrative of Cape Breton harmonize with present geographical features of the island. It is a mistake, I believe, to take it as a matter of course that Loreine, or Lorraine was St. Lawrence Cape from the mere similarity of name. L'Escarbot's and Champlain's maps of 1609 and 1612 have very likely assisted in perpetuating an error. Both these writers, in order to give Cartier's names to places in the gulf, actually place St. Paules on an islet to the south of Cape Loran, or the present (presumably) Cape North. L'Escarbot also gives a Cape Loraine on the southwestern coast of Newfoundland, and that is how Brown has probably been mislead. Neither L'Escarbot nor Champlain ever visited northern Cape Breton previous to 1612, and their early maps were largely tentative. In Champlain's later map of 1632, however, he corrects his mistake with a better knowledge of Cape Breton and its coasts, and places the rocky islet of St. Paul to the northeast of Cape North—its correct position. Brown evidently had not the advantage of studying the several accounts of the voyage, or he would not have made the mistake of supposing that Cartier first made Cape Ray, in Newfoundland, (Loraine in Brown) and then wénd towards Cape Breton, and named Cape St. Paul's, (Cape North in Brown) when it is quite clear that his course was from the Magdalens to the northern capes of the island, and thence to the Newfoundland coast. Here Hakluyt's version is perplexing, for it says that Cartier (see *supra*) had "notice of the coast lying east southeast distant from the Newfoundland about 27 leagues." But the French versions (which see) make the course clear when we read that after leaving the capes of Cape Breton "we had knowledge of the east southeast coast of Newfoundland, about 27 leagues from the said cape" (St. Paules). In this way by reconciling certain little discrepancies in the several narratives, and making changes in the punctuation, we can make Cartier's course perfectly intelligible from the time he left the "islands towards the sands" until he made the coast of Newfoundland, and found shelter in a little harbour which he named St. Esprit, and is believed to be either Port aux Basques or Lapoile. It is for these reasons I should read the narrative of Cartier's voyage, as follows; but let me say first, D'Avezac in his notes on the édition originale (see next page) also points out the necessity of comparing the several versions, and correcting obvious omissions, and errors that have occurred in the original editing or copying:—

"Après lesquelles choses connues retournasmes au cap de ladicte terre, qui se faict à deux ou trois caps haultz à merveilles et grand profond d'eaue et la marée si courante, qu'il n' est possible de plus. Nous nommasmes celui cap le Cap de Lorraine qui est en 47½ degrez, au su duquel cap y a une basse terre et semblant entrée de rivière: mais il n' y a hable que vaille. Parsus lesquelles terres vers le su nous veismes une aultre cap que nous nommasmes le cap de Sainct Paul, qui est en 47¼ degrez."

The remainder of the narrative is not material here, as I wish simply to make the references to Cape Breton clear and consistent. Without dwelling further on the subject, I shall only add, that with the appearance of Champlain's second map, St. Paul's cape disappeared from the coast of Cape Breton; and in the course of time, when the geography of the island was well known, and the existence of two large capes was well established, Loreine became St. Laurent and its name was transferred to the present Cape St. Lawrence, while Cape North was named anew.

The statement that appears in some early French writers that Cartier or Roberval erected a fort on the island of Cape Breton, in the year 1540 in most cases, is obviously an error. L'Escarbot (1609, ii. 391) says that Roberval and Cartier together erected a fort in the island—"a mere obiter dicta, and flatly contradicted by the only account of Roberval's voyage extant, with which probably neither Champlain nor Roberval was acquainted." (Pope, "Jacques Cartier," 125-126). Fournier in his "Hydrographie" (1667) and Charlevoix (1744, i. 31) and Mr. de la Chesnaye in a memoir of 1676 ("Quebec Doc." i. 245) make the statement of Roberval alone. Sir W. Alexander in his "Encouragement to Colonies" (1624, p. 15) says that Roberval lived "one winter at Cape Breton," but, as an authority ("Nar. & Crit. Hist. of Am." iv. 58 *n.*) says with truth, "his style is loose and by Cape Breton he probably meant Canada." Not a single modern historical writer attaches any importance to the assertion. Faillon (i. 43-44) is of opinion that L'Escarbot and other writers clearly did not know anything of Roberval's own account of his voyage. It is now admitted on all hands that Cape Breton was clearly a mistake for Cap Rouge. In 1542 Jean François de la Roche, Lord of Roberval, a gentleman of Picardy, who was named "the petty king of Vinieu" on account of his popularity in his province, built a fort (France Roy) at Cap Rouge by virtue of his commission as lieutenant and governor of Canada and Hochelaga. This fort "stood on that bold acclivity where Cartier had before entrenched himself, the St. Lawrence in front, and, on the right, the river of Cap Rouge," (Parkman, "Pioneers," 205.) Cartier's fort was erected by September 1541 in the same neighbourhood and was known as Charlesbourg royal. He

was in France from 6th July, 1536, until 23rd May, 1541. Roberval erected his fort in the summer of 1542 and remained on the St. Lawrence probably until some time in 1543, though De Costa ("Nar. & Crit. Hist. of Am., iv. 58) believes he left France in August, 1541. It is quite clear, however, that Roberval, like Cartier, was in France in 1540, the time mentioned by several writers as the date of the construction of the supposed fort in Cape Breton.

The narratives of the three voyages of Jacques Cartier are found in the following works:

L'Escarbot, "Histoire de la Nouvelle France" gives an account of the first voyage taken, according to the best authorities, from a French translation of Ramusio's narrative. It bore the title: "Discours du voyage fait par le capitaine Jacques Cartier aux terres neuves de Canadas, Norembergue, Hochelage, Labrador, et pays adjacens, dite Nouvelle France, avec particulières meurs, langage, et cérémonies des habitans d'icelle" (Raphael de Petit-val, librario et imprimeur du Roi, Rouen, 1598, petit 8vo., 64 pp.,) L'Escarbot's reproduction is not carefully made (Harrisse, 2.) It gives Cartier's commission of 1540. L'Escarbot's works have appeared in numerous editions at Paris, in 1609, 1611, 1612, 1617, 1618, and the Tross ed. of 1866 in 3 vols.

Hakluyt gives three accounts of the voyages. The first is taken from an English translation of Ramusio by John Florio: "A Short and Briefe Narration of the two Navigations and Discoveries to the Northwest Partes called Newe France," (London, 1580.) Hakluyt follows Ramusio also in the second voyage. The account of the third voyage is fragmentary and supplemented by a narrative of Roberval's voyage.

The Literary and Historical Society of Quebec, in 1843, published a small volume containing: "Voyages de Découverte au Canada entre les Années 1534 et 1542, par Jacques Cartier, le Sieur de Roberval, Jean Alphonse de Xanctoigne, etc. Suivis de la description de Québec et de ses environs en 1608, et de divers extraits relativement au lieu de l'hivernement de Jacques Cartier en 1535-36, avec gravures facsimile." The account of the first voyage is from the Rouen translation of 1598, though L'Escarbot's want of exactness is not corrected. (D'Avezac, xv.) The account of the second voyage is taken from one of three manuscripts in the national library at Paris, its date being apparently that of the middle of the 16th century. (I notice these manuscripts in the next paragraph). The account of the third voyage is the fragment in Hakluyt.

The Paris publisher, Tross, printed in 1863, an account of the second voyage under the following title: "Bref Récit et Succincte Narration de la navigation faite en MDXXXV et MDXXXVI par le Capitaine Jacques Cartier aux Isles de Canada, Hochelaga, Saguenay, et autres. Réimpression figurée de l'édition originale rarissime de MDXLV avec les variantes des manuscripts de la Bibliothéque Impériale précédée d'une bréve et succincte introduction historique par M. d'Avezac." The only copy now known to be extant of the "bref récit" of 1545, here reprinted by Tross, is in the Grenville Collection of the British Museum. In the National Library at Paris, however, there are three copies in MSS. of this original narrative (Nos. 5589, 5644, and 5653), and it is the third of these that the Quebec Literary and Historical Society reproduced (pp. 24-69) in the collection just noticed, after having compared it with the two others, and with L'Escarbot and Ramusio. M. d'Avezac's historical introduction is excellent. His notes of variations in the three manuscripts are of great aid to the student.

Another narrative was published in 1867, as an original account of the voyage of 1534, though the date is given inaccurately as 1544—a circumstance not easily explained if it is Cartier's original account: "Relation originale du voyage, de Jacques Cartier au Canada en 1534: Documents inédits sur Jacques Cartier et le Canada (nouvelle série) publiés par H. Michelant et A. Ramé, accompagnés de deux portraits de Cartier, et de deux vues de son manoir (Paris, Tross, 1867).

For further facts on the bibliography of Cartier's voyages, see Harrisse (Notes sur la Nouvelle France, no. 5; Cabots, p. 79, Bibliotheca Americana Vetustissima, no. 267), Sabin, (Dictionary, iii. no. 11,138). D'Avezac's introduction, (xv-xvii); "Nar. and Crit. Hist. of Am.," (iv. 63 *et seq.*) Warburton (Conquest of Canada) has for frontispiece in the first volume, an engraving of the original portrait of Cartier at St. Malo. It is also reproduced in Charlevoix, Historie de la Nouvelle-France. (Shea's ed., i. 110); Le Clercq's Etablissement de la Foy (Shea's ed.); Faillon's Historie de la Colonie Française, vol i.; Sulte's Historie des Canadiens-Français, 1608-1880 (Montreal, 1882, vol. i). All follow the St. Malo copy. Two other portraits are given in the ed. of the first voyage, published by Tross in 1867.

One of the portraits and sketches of the manoir at Limoilou given in Michelant and Ramé's work are reproduced in "Jacques Cartier: His Four [?] Voyages to Canada. An essay, with historical, explanatory and philological notes," by H. B. Stephens, B.C.L. (Montreal, 1891, sm. 4to.). This is one of four essays that won the medals offered by Lieutenant-Governor Angers of Quebec for the best paper on "Jacques Cartier and his Time,"—the others being by Joseph Pope (whose monograph has been already mentioned); by Dr. N. E. Dionne of Quebec; and by Toüon de Longrais, Rennes, France. Mr. Stephens's work is not, strictly speaking, an essay, but a series of translations of the voyages, with copious notes, which have some value for the uninstructed reader. He mentions the several editions of the voyages.

VIII. Extracts from Narratives of Early Voyages to Cape Breton.

(1). In Hakluyt's 'Discourse of Western Planting,' written in 1584, (vol. viii) reference is made to a visit paid to the coast of Cape Breton to 1583 by his friend Stephen Bellinger of Rouen, at the expense of the Cardinal de Bourbon. Bellinger found a town of eighty houses, covered with the bark of trees, upon a river's side about a hundred leagues southwest from the aforesaid Cape Breton. He reported that the country was of the temperature of Gascoigne and Lyuyann, and places it in Norembeque. It is obvious that he does not know that Cape Breton is an island, for he refers only to the promontory from which it is named. The river of which he speaks may be St. Mary's, in the present County of Guysboro, Nova Scotia.

(2). In 1594 Sylvester Wyet, a master mariner of Bristol, visited the Gulf of St. Lawrence, in the "Grace" of that town, a vessel of thirty-five tons. He anchored first in St. George's Bay, Newfoundland, where he found the wrecks of Biscayan ships, and then went on to the island of Anticosti, called Natiscotec by the native Indians, and Assomption by Cartier. As Wyet was the first navigator who describes Cape Breton as an island, the following extract from his narrative, as given by Hakluyt (xiii. 60) will be read with interest.

"When we had dispatched our businesse in this Bay of S. George and stayed there ten dayes, wee departed for the Northern point of the said Bay, which is nine or ten leagues broade. Then being enformed, that the whales which are deadly wounded in the grand Bay, and yet escape the fisher for a time, are woont vsually to shoot themselves on shore on the Isle of Assumption, or Natiscotec, which lieth in the very mouth of the great riuer that runneth vp to Canada, we shaped our course ouer to that long Isle of Natiscotec, and wee found the distance of the way to the Estermost ende thereof to be about fourty foure leagues; and it standeth in the latitude of 49. Here wee arriued about the middest of Iune at the East end, and rode in eighteene fadome water, in faire white sand and very good ankerage, and for tryall heaued a lyne ouerboorde and found wonderful faire and great Cod fish; we went also seuen of vs on shore and found there exceeding fayre great woods of tell firre trees, and heard and sawe store of land and sea foules, and sawe the footing of diuers beastes in the sand when we were on shore. From the Easter end we went to the Norther side of the Island which we perceiued to be but narrow in respect of the length thereof. And after wee had searched two dayes and a night for the Whales which were wounded which we hoped to haue found there, and missed of our purpose, we returned backe to the Southwarde, and were within one league of the Island of Penguin, which lyeth South from the Eastermost part of Natiscotec some twelve leagues. From the Isle of Penguin wee shaped our course for Cape de Rey and had sight of the Island of Cape Briton: then returned wee by the Isles of Saint Pedro, and so came into the Bay of Placentia, and arriued in the Easterside thereof some ten leagues vp within the Bay among the fishermen of Saint Iohn de Luz and of Sibiburo and of Biskay, which were to the number of threescores and odde sayles, whereof eight shippes onely were Spaniardes, of whom we were very well vsed and they wished heartily for peace between them and vs."

(3) In 1597 the Hopewell of London and the Chancewell of the same port, visited the eastern coast of the present Dominion of Canada under the respective commands of Charles Leigh, one of the owners, and of Stephen Van Herwick, a brother of the other owner. They visited the coast of Newfoundland, and then went on to Cape Breton of which they left the following interesting account, given in Hakluyt (viii, 62):

"The 14 of Iune we sent our boat on shore in a great bay vpon the Isle of Cape Briton for water. The 25 we arriued on the West side of the Isle of Menego, where we left some caskeno shore in a sandy bay, but could not tarry for foule whether. The 26 we cast anker in another bay vpon the maine of Cape Briton. The 27 about tenne of the clocke in the morning we met with eight men of the Chancewell our consort in a shallope; who told vs that their ship was cast away vpon the maine of Cape Briton, within a great bay eighteene leagues within the Cape, and vpon a rocke within a mile of the shore, vpon the 23 of this moneth about one of the clocke in the afternoone: and that they had cleered their ship from the rocke: but being bilged and full of water, they presently did run her vp into a sandy bay, where she was no sooner come on ground, but presently after there came aboord many shallops with store of French men, who robbed and spoiled all they could lay hands on, pillaging the poore men euen to their very shirts, and vsing them in sauage maner: whereas they should rather as Christians haue aided them in that distresse. Which newes when we heard, we blessed God, who by his diuine prouidence and vnspeakeable mercy had not onely preserued all the men, but brought us thither so miraculously to ayd and comfort them. So presently we put into the road where the Chancewell lay: where was also one ship of Sibiburo, whose men that holpe to pillage the Chancewell were runne away into the woods. But the master thereof which had dealt very honestly with our men stayed in his ship, and came aboord of vs whom we vsed well, not taking any thing from him that was his, but onely such things as we coulde finde of our owne. And when we had dispatched our businesse, we gaue him one good cable, one olde cable and an anker, one shallop with mast, sailes, and other furniture, and other things which belonged to the ship. In recompense whereof he gaue vs two hogsheads of sider, one barrel of peaze, and 25 score of fish. The 29, betimes in the morning we departed from that road toward a great Biskaine, some 7 leagues off of 300 tun whose men dealt most doggedly with the Chancewels company. The same night we ankered at the mouth of the harborow, where the Biskaine was. The 30 betimes iin the morning we put into the harborow; and approaching nere their stage, we saw it vncovered, and so suspected the ship to be gone: whereupon we sent our pinnesse on shore with a dozen men, who when they came, found great store of fish on shore, but all the men were fled; neither could they perceiue whether the ship should be gone but as they thought to sea. This day about twelue of the clocke we tooke a Sauage's boat which our men pursued: but all the Sauages ran away into the woods, and our men brought their boat on boord. The same day in the afternoone we brought our ship to anker in the harborow: and the same day we tooke three hogsheads and a halfe of traine, and some 300 of greene fish. Also in the euening three of the Sauages, whose boat we had, came vnto vs for their boat; to whom wa gaue coats and kniues, and restored them their boate again. The next day being the first of Iuly, the rest of the Sauages came vnto us, among whom was their king, whose name was Itarey, and their queene to whom also we gave coats and kniues, and other trifles. These Sauages called the harborow

Cibo [Sydney]. In this place are the greatest multitude of lobsters that euer we heard of: for we caught at one hawle with a little draw net aboue 140. The fourth of Iuly in the morning we departed from Cibo. And the fifth we cast anker in a reasonable good harborow called New Port vnder an Island some eight leagues from Cibo, and within three leagues from the English port [Louisbourg]. At this place in pursuing certain shallops of a ship of Rochel, one of them came aboord, who told vs, that the Biskainer whom we sought was in the English port with two Biskainers more, and two ships of Rochel. Thereupon wee sent one of our men in the Rochellers shallop to parle with the admiral and others of our friends in the English port, requesting them ayd for the recouery of our things, which the other ship called the Santa Maria of S. Vincent (whereof was Master Iohannes de Harte, and Pilot Adame de Lauandote) had robbed from the Chancewell. To which they answered, that if we would come in vnto them in peace, they would assist vs what they might. This answere we had the sixth day: and the seuenth in the forenoone we arrived in the English port, and cast anker aloofe from the other ships: which done, I went aboord the Admirall, to desire the performance of his promise: who sent for Iohannes de Harte, who was contented to restore most of our things againe: whereupon I went aboord his ship to haue them restored. This day and the eighth I spent in procuring such things as they had robbed; but yet in the end we wanted a great part thereof. Then we were briefe with them, and willed them either to restore vs the rest of our things which they had, or els we would both inforce them to doe it, and also haue satisfaction for our victuals and merchandises which by their means were lost in the Chancewell. The ninth in the morning wee prepared our ship to goe neere vnto them. Whereupon their Admirall sent his boat aboord, and desired to speake with me: then I went aboord vnto him, and desired to haue our things with peace and quietnesse, preferring to make him and the Masters of the two ships of Rochel our vmpire, and what they should aduise I would stand vnto. Hereupon he went aboord the other ship to make peace; but they would heare no reason, neither yet condescend to restore any thing els which they had of ours. Then I desired that as I came in peace vnto them, they would so set me aboord my ship againe: which they denied to do, but most vniustly detained me and Stephen van Herwicke who was with me. A while after our shallop came with foure men to know how I did, and to fetch me aboord: but so soon as she came to the Admirals ships side, his men entred, and took her away, detaining our men also as prisoners with vs. Then presently all the three Biskainers made toward our ship, which was not carelesse to get the winde of them all; and hauing by the mercy of God obtained the same, shee then stayed for them: but when they saw that they had lost their aduantage, they presently turned their course, making as great haste in againe as they did out before. Afterwards I attempted twise to goe aboord, but was still enforced backe by the two other Biskainers, who sought our lives so that in the end the Master of the Admirall was inforced to man his great boat to waft vs: and yet notwithstanding they bent a piece of great ordinance at vs: for we were to passe by them vnto our ship: but we rescued our shallop vnder our Masters great boat; and by that means passed in safety. The next morning being the tenth of the moneth, we purposed if the wind had serued our turne, to haue made them to repent their euill dealing, and to restore vs our owne againe, or els to haue suncke their ships if we could. But the winde serued not our turne for that purpose; but carried vs to sea: so that the same morning wee tooke our course toward the bay of S. Laurence in Newfoundland: where wee hoped to finde a Spanish ship, which, as we had intelligence, did fish at that place. . . . . The land of Cape Briton we found to be somewhat like the Newfoundland, but rather better. Here toward the West end of it we saw the clouds lie lower than the hills: as we did also at Laurence in Newfoundland. The Easterly end of the land of Cape Briton is nothing so high land, as the West. We went on shore vpon it in fiue places: 1. At the bay where the Chancewell was cast away: 2. At Cibo: 3. At a little island between Cibo and the New port: 4. At the New port: and 5. At Port Ingles, or the English port."

Four well known editions have appeared since 1589 of Richard Hakluyt's "Principall Navigations, Voyages, Trafliques and Discoveries of the English Nation, made by sea or overland, &c." The first appeared in 1589 (George Bishop and Ralph Newberie, London. 1 vol. sm. folio) The second in 1598-99-1600 with the original suppressed expedition to Cadiz by Lord Essex, though it is wanting in some copies, (G. Bishop, R. Newberie and R. Barker, London, 3 vols. sm. fol. and 3 sm. folio in 2.) The third, in 1809-12, edited by R. H. Evans. (G. Woodfall, London, roy. 4to. 5 vols. The fourth, in 1885-90, edited by Edmund Goldsmid, F. R. H. S., (E. & G. Goldsmid, Edinburgh, 20 vols. roy. 8vo.) This new edition which is well printed and carefully edited, is based upon that of 1598-99-1600. Copies of the three first editions are now very rare and expensive. Quaritch in his most recent catalogue offers copies from £40 for the 2 ed. in 3 vols., sm. folio, to £14 for the Woodfall ed. (Nos. 191, 192, 193, 194, 195 in cat.) The Hakluyt Society of London, since its foundation in 1848 to 1888, have printed a number of the more valuable voyages. See Quaritch, No. 238, for a complete list of all the publications of the Society to 1888. The copy in the Parliamentary Library at Ottawa is the edition of 1599-1600. The references in these notes is to the Goldsmid edition, which I have compared with the original edition just named.

(4.) The following is Champlain's description of Cape Breton:

"Ceste isle du cap Breton est en forme triangulaire qui a 80 lieues de circuit, et est la plus-part terre montagneuse, toutesfois en quelques endroits agréable. Au milieu d'icelle y a une manière de lac [Labrador, now le Bras d'or] où la mer entre par le coste du nort quart du nordest, et du sud quart du suest, et y a quantité d'isles remplies, de grande nombre de gibier, et coquillages de plusieurs sortes, entre autres des hiustres qui ne sont de grande saveur. En ce lieu y a plusieurs ports et endroits où l'on fait pesche de poisson, scavoir le port aux Anglais [Louisbourg] distant du cap Breton environ deux a trois lieues: et l'autre Niganis 18 ou 20 lieues plus au nort. Les Portugais autrefois, voulurent habiter cet isle, et y passeient un hyver: mais la rigueur du temps et les froidures leur firent abandonner leur habitations." (Champlain, ii, 280. Also iv. 107.)

The best Canadian edition of Champlain's works is the following:

"Œuvres de Champlain, publiées sous le patronage de l'Université Laval. Par l'abbé C. H. Laverdière, Professeur d'histoire." (Quebec, 1870, 4 vols. 2 eds.) In this edition was printed for the first time the text of Champlain's first American voyage, 1509-1602. It is a monument to the spirit and patriotism not merely of Laval University and the Seminary of Quebec under whose patronage it was published, but of the publisher Geo. E.

Desbarats, well known in Canada for his encouragement of literary enterprise, too often without adequate reward. There is a perfect copy of the voyage of 1603 in the imperial library at Paris, and the edition of 1613 (Paris, Jean Berjon) is so rare that there are only ten copies in Canada, and of these the one in the library of the University of Laval is alone perfect, since it contains the great map, and the two imprints of the small map. Abbé Laverdière says (preface, iii) he himself paid 500 frs. at Paris for a copy. Quaritch prices one (No. 75), which has only a facsimile of the large map and is otherwise imperfect, at £16. The edition of 1632 (Paris, Claude Collet) is priced by him at £52.10 (No. 752), and another with a new title page at £50 (No. 754). Dufossé prices two copies in his possession—one of 1620 (Paris, Claude Collet) at 1000 frs.; the other of 1632 at 450 frs. (Nos. 40974 and 40675). The Prince society of Boston published in 1878-80 a small edition of 250 copies, translated by Ch. Pomeroy Otis, with a memoir by Rev E. F. Slafter. The parliamentary library at Ottawa has copies of the edition of 1613, Jean Berjon, 4to.; of 1627, Claude Collet, 12mo.; of 1632, Em. Souvestre, 4to.; of 1640 in 4to., Claude Collet, same as that of 1632 with only a fresh title; of 1830, in Quebec, 2 vols. 8vo.—which is not reliable, as it was printed hastily to make work for printers—and the Laverdière ed. of 1870. The Abbé's notes give great value to the Quebec edition, whose only defect is the very brittle paper on which the maps are given, and the somewhat inferior artistic character of the illustrations in some cases compared with the originals. The "Nar. and Crit. Hist of Am." (iv. 119) gives Champlain's autograph and portrait from the Hamel painting after an old engraving by Moncornet. Sulte in "Histoire des Canadiens Français" vol. i, has another portrait, not very well executed, evidently from Roujat's woodcut. The portrait in the parliamentary buildings (speaker's chambers) at Ottawa is by Hamel, a copy from Moncornet. For bibliography of Champlain see an article by Mr. Slafter, author of the memoir in the Prince edition, in "Nar. and Crit. Hist. of Am." iv. 130-134.

(5.) Translation from Nicolas Denys's "Description des Costes de l'Amérique Septentrionale,"[1] vol. i, c. vi, which gives a description of the island of Cape Breton, its ports, harbours, rivers and adjacent islands, the nature of its land, its varieties of wood, its fisheries, hunting and all that it contains.

I return[2] to the island of Cape Breton before proceeding further. It is situated at a distance of ten leagues from Cape Campseaux; is eighty leagues in circumference, including the island of Ste. Marie,[3] which is contiguous to it, and so situated that it forms two passages. One of these passages between the island and the mainland is called the entrance of the little strait of Campseaux, of which I have spoken above,[4] and the other is a space of six leagues between it and the island of Cape Breton, by which one can go from the little strait of Campseaux to Fort St. Pierre. The voyage can be made only by boats or small vessels, but care must be taken in the channel of the little strait. Proceeding along the shores of the island of Ste. Marie we find outside, three leagues away, a little round island named Isle Verte,[5] and to reach there you must keep off to sea. The coast is lined with rocks which stretch well into the sea for a league, and on which a good many vessels have been lost. It is necessary to leave this island to the right to enter the bay of St. Pierre, where we can anchor some little distance off a point of sand. Ships cannot approach closer to St. Pierre than at a distance of three leagues, but small vessels can come nearer, though it is necessary to know the winding channel, besides the situation of many rocks which do not show themselves. The fort is built at the foot of a mountain, almost perpendicular, and it is difficult to climb this coast. There we find on the top a pond which is fed by several springs. The high land declines towards Labrador for eight or nine hundred paces of distance, and on the other side of the entrance descends for about five hundred paces to a little bay or creek where a river flows, and many small fish,[6] like a gudgeon, of excellent flavour, are caught in winter. On the top of the mountain there is excellent land and a number of fine trees. It is here I made a clearing, and had eighty acres of land in cultivation every year before the occurrence of the fire which burned me out.

The stretch of land at the foot of the mountain, where the fort is situated, is more than ten leagues long, but there are no trees there except spruce, and the land is not worth much until we come to a little river, where we find good land and a salmon fishery, besides some wild meadows. It is not difficult to carry goods towards the Labrador, which is an expanse of sea cutting the island of Cape Breton in two, except for the eight hundred paces or so of land which stretches from the Fort St. Pierre to the foot of the sea of Labrador, which forms a kind of gulf, with its entrance on the east of the island and its termination in the direction of the fort. I have made a road in this space[6] to bring my shallops from one sea to the other, and to avoid the circuit which would have to be made by water. The tide comes up to the bottom of the gulf, of which the length is twenty leagues from its entrance to within eight hundred paces of the fort, where it ends. When it is full tide in Labrador it is low water on the other side opposite the fort. The opening of this little sea of Labrador is at the east, exactly on the opposite side. The reason for the difference in tide is the fact that the bay of St. Pierre has its mouth directly on the west, added to the circumstance that it is never high tide in a harbour that the moon is not directly facing the entrance of the harbour, either above or below the horizon. In Labrador there is a great basin or lake of eight leagues in length and five in width, with little bays or creeks on each side, which stretch into the land. All around Labrador there

[1] See *infra*, App. IX, for a reference to Denys's "Work on America."

[2] The previous chapters of the work had been devoted to a description of Acadie, and after his account of Cape Breton in the present chapter he goes on to refer to the country on the Gulf of St. Lawrence, Baie des Chaleurs, etc.

[3] Isle Madame. His description of the various localities, it will be seen in this chapter, are very vague. His knowledge of the island was chiefly confined to St. Peter's, the Labrador and St. Anne.

[4] He had just described the coast of eastern Acadie from Campseaux to beyond Antigonishe, which he calls Articougnesche.

[5] Now called St. Peter's Island,

[6] Probably smelts,

[7] St. Peter's isthmus now cut by a ship canal.

are heights in which we find quantities of plaister in some places. The land is not very good, although the mountains are covered with trees, chiefly consisting of pines, spruce and a few oaks and beeches. The fishing is not good, for we find chiefly oysters, which are not of the best flavour, on account of their freshness when they are first dragged up, but they can be kept eight or ten days with their juice, and then when they are salted they lose that sickly taste which arises from the fresh water of the rivers at the mouth of which they are taken.

Leaving the port of St. Pierre by way of Campseaux to make a tour of the island in an easterly direction we come first to Ile Verte, and next to the rocks known as Isles Michaur,[1] some three leagues off, where the codfishery is excellent. Thence to the English harbour[2] is a distance of ten leagues, mostly of rocky coast. At the entrance of the port there is an island[3] which must be kept well on the left, but once inside ships are safe, as the anchorage is good. The land is mostly high and rocky, and at the bottom of the harbour is a pond[4] where one may catch a great number of eels. The codfishery in this locality is good. The Olonnois[5] formerly came here to winter that they might be the first on the grand bank for the catch of green cod, and the first to return to France, as such fish sells best when it is quite fresh. Three leagues further east is the port of Baleine, which is still a good harbour despite its difficulty of access on account of the number of rocks. We next reach the Fourillon,[6] which is behind Cape Breton. This cape is only an island,[7] and the part of the island which bears this name lies towards the southeast, and is only a collection of rocks behind which vessels sometimes find shelter while they catch the fish, which are exceedingly plentiful here. All the land of this part of the country is poor, although there are some fine trees on the hills, like beech, birch, a few pines, and plenty of spruce. Going on further we come to Spanish River,[8] in the entrance of which vessels can lie quite securely. A mountain of excellent coal is found four leagues up the river, and the land is for the most part pretty good. One side is covered with beech, birch, maple, ash and some kinds of oak, besides pine and spruce. From the sources of this river we can cross over to the Labrador,[9] passing on the way at least three leagues of wood. Leaving Spanish river to enter Labrador we find for a distance of three leagues many rocks, at the end of which is the entrance of little Cibou or Labrador, where there is a good deal of coal. At this point commences a great bay which comes close to Inganiche; it is eight or ten leagues broad; inside there are many rocks where the cormorants make their nests. Beyond these rocks on the right is Great Cibou, which is the entrance of the harbour of St. Anne, which is good and spacious.[10] Its entrance is between two points and has not a hundred paces of width. Vessels of three or four hundred tons can enter at all tides; the anchorage is good, and when the cable parts the vessel finds itself only in the mud. The harbour will hold a thousand vessels, the basin is surrounded by mountains, the rocks are very high, ships can put their bowsprit on the land at the right side of the entrance; that is to say, in entering they can approach the land so close that the jibboom of the bowsprit can touch the rocks, which are quite steep. Some small rivers and brooks fall into the harbour from the surrounding mountains. At the bottom of the harbour there is a mountain as white as milk and as hard as marble. In another place there is some land full of pebbles of all colours. Some stones of considerable size have fallen on the shores, and although the sea beats against them continuously they appear to harden so much, both in the air and water, that tools make little or no impression upon them—a fact that makes me believe that they will look as handsome as polished marble, or as the white rock of which I have just spoken, if any one should make the experiment. Salmon are caught in the harbour; mackerel, which are also plentiful and sometimes of great size, can be taken with the line at the entrance. There is a point of sand where one can find a great many shells. At the base of the mountain there are some ponds where we find numbers of bustards, ducks and other game, which offer abundant sport.

On the way to Inganiche we pass eight leagues of coast remarkable for its high rocks, as steep as a wall. If a vessel should be lost there no one would be saved, for Inganiche, which is about two leagues from the point, would afford little security, since it is little better than a roadstead lying between islands[11] which are somewhat in the offing opposite a small sandy bay. Vessels anchor here between the islands and the land. Sometimes you see three ships there, but they are not safe. Nevertheless it is a locality which is first made on this coast, because the fishing is good and the fish take the hook readily. From the Fourillon or Cape Breton it is perhaps from eighteen to twenty leagues as far as Inganiche, and thence to Cape North five or six leagues by a very rocky coast. At Cape North there is room for a vessel to fish, and from the cape to Chadye[12] the distance is about fifteen or sixteen leagues. All the coast in this direction is extremely rocky and covered with spruce, mixed with a few small beech. We see on this dangerous coast a few sandy coves and little bays where a shallop can hardly find shelter. Chadye is a big bay about two leagues deep, at the foot of which is a sandy beach full of pebbles that the sea has worn, and behind it is a pond of salt water. This bay is surrounded by rocks on the two sides. We find plenty of cod in this locality to attract vessels, although they run much risk from want of sufficient shelter in case of storms.

Continuing the voyage along the coast, which is rocky and steep for four leagues, we came to a little island opposite a little sandy bay where shallops can find shelter. In this bay there is a mountain of black stone, which carpenters use to mark their work. It is hard and not of the best quality. We then pass about eight leagues of coast until we find lower land and flats covered with all sorts of wood like ash, beech, birch, maple, pine and

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[1] Now the Basque islands, off Michaux Point; the same name was applied to those islands in Denys's time.

[2] Louisbourg.

[3] Goat Island, where the French had a battery to defend the entrance of the harbour when Louisbourg was founded.

[4] Reference is here made to the barachois at the southwestern part of the harbour, close to the town of Louisbourg.

[5] The men of the Sables d'Olonne, famous for its sailors, are probably meant.

[6] Forillon is a name applied to a large rock, split off the coast, as at Gaspé.

[7] Brown, in his "History of Cape Breton" (p. 179), gives a description of this point which explains what Denys here tell us: "If a vessel is bound for Louisbourg, steering westerly with Scatari on the starboard, she will run close past a large *rock* covered with waving grass, elevated some fifty feet above the level of the sea, called Port Nova [Porto Novo] Island, which is connected by a reef of sunken rocks, with a low point about a mile to the northward. . . . This is the very cape from which the island is named."

[8] Sydney Harbour.

[9] The East Bay of the Labrador—a beautiful inlet of the lake.

[10] His description of St. Anne is necessarily more accurate and full than that of other ports and bays on the eastern coast, since he had personal knowledge of it.

[11] He must refer to Inganiche Island.

[12] He refers probably to Cheticamp, but his description of the northwest coast of Cape Breton is too vague—obviously made up from mere rumour—to enable us to identify the localities with any degree of exactness.

spruce, but none are of the best quality. Then we enter a little river where shallops go and catch salmon. Here we see a coal mine, and I am told plaister[1] is also abundant, but I have not found it. The wood in this river is good and the land is not mountainous. From the mouth of this small river to the entrance of the little passage of Campseaux, on the north side, there is only a distance of three leagues, and thence to the other entrance on the south side, about ten leagues, where I commenced the voyage, and now end it after having made the circuit of the island. The total distance around is generally given at eighty leagues; both the coast and the interior are remarkable for their rocky and mountainous character, but the fine bays and harbours which vessels can frequent with safety give the island great value for carrying on the fisheries. Mackerel and herring are abundant around the coast, and fishermen can find plenty of bait for catching codfish, which are very plentiful. Cape Breton has also been famous for moose, which were found in great quantities, but at present there are none,[2] as the savages have destroyed them all, and have mostly abandoned the island since it does not give them sufficient game to live on. I do not mean to say that there is not still in the island various kinds of game in abundance, but there are not the kinds the Indians prefer. Besides it costs them too much for powder and lead, for with the one shot with which they can bring down a large animal like a moose they will only kill a bustard or two, sometimes three, and these are not sufficient to satisfy the gross appetite of themselves and families.

IX. French Sources of Information on Cape Breton and Louisbourg.

We find an interesting description of the fisheries, resources and natural features of Cape Breton in the work published by Nicholas Denys, who was made governor and lieutenant-general of the French king "throughout the country, territory, coasts and borders of the great bay of St. Lawrence from Cape Canceau up to Cape Rosiers, Newfoundland, Cape Breton, St. John and other adjacent islands, in order to re-establish our dominion." After his failure to sustain his rights in this wide territory, he devoted the close of his life to describe the country where he had lived for about forty years. This book bears the elaborate title, "Description Géographique et Historique des Costes de l'Amérique Septentrionale, avec l'Histoire Naturelle du Païs. Par Monsieur Denys, Gouverneur, Lieutenant-Général pour le Roy, et propriétaire de toutes les Terres et Isles qui sont depuis le Cap du Campseaux jusque au Cap des Rosiers. Tome I. À Paris, chez Louis Billaine, au second pillier de la Grand' Salle du Palais, à la Palme et au grand César. 1672. 16mo., pp. 267." The second volume is entitled: "Histoire Naturelle des Peuples, des Animaux, des Arbres et Plantes de l'Amérique Septentrionale, et de ses divers Climates. Avec une description exacte de la Pesche des Molues, tant sur le Grand Banc qu'a la Coste, et de tout de ce qui s'y pratique de plus particulier, etc. Par Monsieur Denys, Gouverneur, Lieutenant-Général pour le Roy, & Propriétaire de Toutes les Terres & Isles qui sont depuis le Cap de Campseaux jusques au Cap des Roziers. Tome second. À Paris, chez Louis Billaine, au second pillier de la Grand' Salle du Palais, à la Palme et au Grand César. 1672. 16mo., pp. 480."

This work is exceedingly rare and costly even in an imperfect form. A copy with the original map and two plates, which appear always in the second volume, and which Harrisse (Nos. 136, 137) could not find in any of the copies he examined, is put at 900 francs in Dufossé's Catalogue (Paris) No. 51,038. Another, with admirable *facsimiles* of the original map and figures (in the possession of the present writer), cost 300 francs. Another (No. 51,039), with inferior *facsimiles* and two leaves in manuscript, is given at 150 francs. The same dealer offers *facsimiles* on old paper of the map and the illustrations simply—the latter relating to the codfisheries—at 25 francs. The copy in the library of the Canadian parliament is without the map. Harvard library has two copies—one with the imprint "Chez Louis Barbin," but without the original map; and also has a Dutch version of 1688. It seems Denys ceded his rights to both Billaine and Barbin (see "Extrait du Privilege du Roy" at end of first volume). Copies are also found in the library of Congress and in the Carter-Brown collection (see "Nar. & Crit. Hist. of Am.," iv. 153; "Carter-Brown Cat.," ii. 1,070; "Sabin," v. No. 19,615). Brown, in his "History of Cape Breton," gives a sketch of Cape Breton and of the eastern coast of Acadie (p. 103), taken from Denys's map. Brown says that it gives no place to Sydney harbour, though Denys describes it in the text, but it is obvious that Sydney is named in the map "La R. Denys," which, in these later times, is a river in the northwestern section running into the upper part of the Bras d'Or Lake. The map on the whole is accurate wherever Denys had special knowledge of the country. While his merit as a historian is doubtful, his description of the places he visited has some value. Charlevoix says that "he tells nothing but what he saw himself." See "Charlevoix," ii. 195 *et seq.*, for an account of Denys, "whose departure from Cape Breton was a great misfortune for this part of New France, which never had a more capable or energetic head." P. S. Hamilton has in the Toronto 'Week' (Dec. 18, 1891) a sketch of Denys's life, but he gives no new facts relative to his career, and incorrectly calls him St. Denys.

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[1] Denys had a right to levy a tax on all coal and plaister found within the limits of his grant. He may speak here of the place called Plaister Cove. The little river must be the Marguérite, always famous for salmon, but it is not a small stream. He was, however, ignorant of this section of the island and speaks only by report. His distances, it is evident, are generally mere estimates.

[2] He refers to those parts of the island with which he was personally acquainted. It is only within half a century or so that the moose has nearly disappeared from the northern parts of the island, where, for a century and a half after Denys's time, it was found in great numbers. Haliburton ["Hist. of N. S.," ii. 243] speaks of it as still inhabiting the recesses of the forest, "though in diminished numbers," in 1829.

"Lettres et Mémoires pour servir à l'histoire du Cape Breton" (à la Haye, 1760), is the only early work, after that of Denys, that gives a detailed description of the bays, harbours, resources, commerce, government and general condition of the island as it appeared to the author from 1751 to 1753, when Count de Raymond was governor. It also includes a description of the Island of St. John (Prince Edward Island) and of the habits of the Indians. A large portion of the work, which is in the form of a series of letters, contains reflections on the cause and origin of the Seven Years' War, a statement of the French grievances against the English, a relation of the taking of the Alcide and the Lys and of the surrender of Fort Beauséjour, and an account of the siege of 1758. It concludes with "a conversation between an Englishman of merit and the author on the importance of Cape Breton to both powers." A translation of the work, now before me, was published in London, 1760, for J. Nourse, in the Strand, under the title, "Memoirs relating to the Natural, Civil and Commercial History of the Islands of Cape Breton and Saint John, from the first settlement there to the taking of Louisbourg by the English in 1758. By an Impartial Frenchman. Quis nescit primam esse historiæ legem ne quid falsi dicere audeat? Deinde ne quid veri non audeat. Translated from the Author's original manuscript." He has an "epistle dedicatory" (épître dedicatoire) "offered to the four illustrious personages who shared the honour of this glorious and important conquest." These are "the able minister who formed the plan," William Pitt; "the respectable director of the board of trade and plantations," Lord Halifax (see Bancroft's "United States," ii. 471); "the admiral and general who displayed such conduct and bravery in the execution," Boscawen and Amherst. The author was Thomas Pichon, alias Thomas Signis Tyrrell—his mother's name—a native of old France, who was brought up at Marseilles, and studied medicine in his early youth. From an interesting note by Dr. Akins in his "Selections from the Public Documents of Nova Scotia" (p. 229), we learn that Pichon "possessed considerable classical attainments, and having been employed as tutor in the family of a nobleman, obtained through his interest an appointment of inspector of hospitals in Bohemia in 1743. While in that country he became acquainted with Count Raymond. When the count was made governor at Louisbourg, in the Ile Royale (now Cape Breton), Pichon went with him as his secretary, and held that situation from 1751 to 1753. He was then transferred to Fort Beauséjour (Chignecto) as a commissary of stores. Having become known to Captain Scott, the commandant of the English fort on the isthmus, he entered into a secret correspondence with Scott, Hussey, etc., the British officers in charge of the English forts, and furnished them with all possible information as to the movements of Le Loutre, the state of the garrison of Beauséjour, etc., until the capture of the forts in 1755. Pichon was made (ostensibly) a prisoner with the rest of the garrison. He was brought first to Pisiquid (Windsor), and then to Halifax. There he was apparently a prisoner on parole, and under the surveillance of Mr. Archibald Hinshelwood, one of the officers of government. Pichon, while in Halifax, made intimacy with French prisoners of rank detained there, and reported their plans and conversations to the Halifax government. He received money and articles of dress, etc., which he requested from the English commandants in exchange for his information. In 1758 he went to London, where he resided until his death in 1781. He wrote a book on Cape Breton and St. John Island (P. E. Island), containing accurate descriptions of the Indians and other valuable information. This work was published anonymously in English and in French, in London, 1760, and in Paris in 1761. He claimed the name of Tyrrell, as that of his mother's family." MS. vol. entitled "Tyrrell Papers," N. S. Archives; Murdoch's "History of Nova Scotia," vol. ii, pp. 261, 272, etc.

The "Biographie Universelle" gives us more information respecting M. Pichon, which does not appear in the foregoing account. He married Madame le Prince de Beaumont in 1756, but did not live happily with her. He died in London, where he engaged in literary pursuits, though the only work of his which appears to have been printed, was the one on Cape Breton. It appears that he was "of a suspicious character, which rendered him fanciful and capricious." He left a fine library to his native town of Vire.

"Histoire et Description générale de la Nouvelle France avec le Journal Historique d'un voyage fait par ordre du Roi dans l'Amérique Septentrionale. Par le P. de Charlevoix, de la Compagnie de Jésus." The edition used in the text of this work was published in six volumes at Paris in 1744. The 4th volume contains Bellin's map and plans of Louisbourg and Port Dauphin, (St. Anne) and his map of Cape Breton, besides an excellent, though brief description of the island (pp.124-142). It is not necessary to say that the famous old Pére's account of Cape Breton is characterised by his usual clearness of style and accuracy of statement.

"Collection de Manuscripts contenant lettres, mémoires, et autres documents historiques relatifs à la Nouvelle France recueillis aux Archives de la Province de Quebec ou copiés a l'étranger" (1883-1885, Quebec, 4 vols.). In this valuable collection of documents, arranged and published under the authority of the legislature of Quebec, there are a number of commissions, memorandums and letters relating to Cape Breton. The most important are the following:—

1. Commission of Nicholas Denys, governor of Acadia, as far as Virginia. i. 141-144.

2. Several letters respecting the evacuation of Plaisance, and the establishment of the new colony in "Ile Royale," commonly called Cape Breton. ii. 559, 560, 565, 566.

3. Capitulation of Canseau in 1744, iii. 201, 202.

4. Papers relating to the siege of 1745, including:—Correspondence between Duchambon and Pepperrell, and Warren during the siege; articles of capitulation; report of the Council of War, with respect to the surrender of the town; letter of M. Duchambon to the French minister, under date of 2nd September, 1745, giving his official account of the siege and surrender of Louisbourg, in accordance with instructions sent him. iii. 220-257.

5. Royal ordinance of the first of November, 1745, providing for the trial of the French soldiers who took part in the revolt at Louisbourg, in the month of December, 1744. At the foot of the ordinance there is the mem: "By a letter from Mr. Karrer, commanding the Swiss regiment, under date of December 11; a sergeant had his head cut off, a corporal and a soldier were hanged, and others condemned to various punishments." iii. 262.

6. A short account of what passed at Cape Breton, from the beginning of the last war until the taking of Louisbourg by the English, in 1758. iii. 465-486. [A misprint is here corrected of 1748 for 1758].

The writer of this interesting memoir commences by stating that he had served at Ile Royale from 1750 until 1758 and then proceeds to relate "the most memorable events that happened there during the war with the same truth and impartiality" that he had observed with regard to his other campaigns. He is certainly very frank in his statements, and gives us some insight into the mismanagement and peculation that long prevailed at Louisbourg. He is the first writer who speaks favourably of the soil of the island, and its adaptability "for yielding rich harvests of all kinds of grain if cultivated." But, he tells us, that "it would not have been for the interest of the intendant that the island should produce the necessary subsistence of its inhabitants, as the means of their heaping up riches proceeds from the immense number of ships sent yearly from France loaded with flour and salt provisions which they embezzle (from France) for their profit, and often pass them twice in Consumation." "This employment," he adds, "is the utter ruin of the French colonies and the hindrance of their flourishing population, as in the British establishments, by their Tyranny and Robberies." Speaking of M. Franquet "Engineer brigadier general," he says that he "was sent to Louisbourg in 1750 as directeur-general of the fortifications. He passed "several years there, raising plans, forming projects, concluding nothing and consequently nothing executing." He lived "in good friendship and harmony with Prévost the intendant, enjoying a very great salary and undoubtedly sharing together the spoils." He gives many details of the siege of 1758, and shows the superficial character of the work performed on the fortifications by Prévost and Franquet "who had drawn M. Drucour, governor of Ile Royale, in their cabal, a brave but very weak and ignorant man in the art of war." He does full justice to the bravery of Vauquelain, commander of the Aréthuse, and has only words of contempt for the officers of the fleet. Franquet's head, he informs us, "turned upon his arrival in France and he died a few weeks after of chagrin. The intendant Prévost, "one of the greatest rascals that ever escaped the gibbet," was confined in the Bastile after his arrival in Paris, but his influence and money soon liberated him, and he was afterwards employed as Intendant at L'Orient. The same writer is also authority for the statement, "that unfortunate hero Vauclin [Vauquelain] who having commanded a frigate during two years at the island of Bourbon and France, with the usual distinguished and remarkable good conduct, on his return to France by the unjust ill treatment which he received from M. Boynes in 1773 [1760?], the then Minister of Marine, he shot himself through the head." The same officer was in command of the French frigates that assisted Lévis in his efforts to regain Quebec in 1760, and distinguished himself on that occasion. The Moniteur de la Flotte in 1857 states that he was treated shamefully on his return to France, and that despite his efforts to obtain justice he died in prison in 1763 without being brought to trial. Some authors even say that he was assassinated in prison, but the Moniteur does not consider the fact proved, (See Garneau, "Histoire du Canada," ii. 369, *n.*) As I shall presently show from the latest authority, these statements are not correct as to the place of his death.

The author of the memoir just cited is believed to be the Chevalier Johnstone, a Scotch Jacobite, who is supposed to have written it some years after his return to France from Canada. The original document is deposited in the French war archives in Paris, and a copy was first made in 1855 and placed in the Library of the Legislative Assembly at Quebec. Johnstone whose life was full of remarkable interest served in America from 1748 until 1759-60, when he acted as aide-de-camp to Chevalier de Levis. His memoir, incorrectly written, but obviously truthful in the main details was published some years ago with other valuable documents by the Literary and Historical Society of Quebec, (See an interesting note with respect to the memoir written by Mr. J. M. Lemoine, "Quebec Lit. and Hist. Society's Doc." 2nd Ser. 1866-7.) The same Society also published two other documents attributed to Johnstone: One "a dialogue in Hades, a parallel of military errors of which the French and English armies were guilty, during the campaign of 1759 in Canada." The other relates to "the Campaign of 1760 in Canada: a Sequel." In the course of this last paper Johnstone gives an account of Vauquelain's brave defence of his frigate l'Atalante in 1760 against the English "who treated him with the regard which bravery can claim at the hands of a generous enemy. It is added that the English Admiral had so great a consideration for him that he sent him to France in an English vessel. "This noble and generous behaviour" says the writer, "did

honour to their nation, by rendering justice to, and discerning the merit of an enemy, far beyond what Vauquelain met with from Berryer the Secretary of the Navy, on his arrival in France." This memoir seems inconsistent with the one above referring to Louisbourg, in which M. Vauquelain is said to have been ill-treated by M. Boynes (or de Borgues as it is given in 'Quebec Society's Trans.'), minister of marine in 1773. Both names and dates are different. On reference, however, to the memoirs, as copied in the "Quebec Documents (iv. 245-265) a note is appended, which does not appear in the version as it is printed by the Quebec Historical Society. This note is obviously appended by the author of the memoir, who speaks of Berryer as "an insolent scoundrel." It would seem then that the Boynes of the first memoir is a misprint of the copyist for Berryer. The Quebec Society and the Quebec Government have obviously published their versions from the same copy deposited in the Legislative Library of Quebec. Berryer was, in fact, minister of marine from 1758 to Oct. 1761, when Vauquelain was in France. (See Extraits des Archives du Ministre de la Marine et des Colonies, "Quebec Doc." 1890, p. 8).

M. Faucher de Saint Maurice, in a paper read in 1885 before the Roy. Soc. of Can. (Trans. iii. sec. 1) on "Un des Oubliés de Notre Histoire" gives an account of Vauquelain's career, derived from authentic sources. It appears that Berryer treated him with neglect when he returned to France in 1760 because he was not a noble, but subsequently M. de Praslin, while minister of marine, gave him an important mission to India, and it was on his return that he was thrown into prison when a new minister whose name is not given was in office. He was only detained for four months; and immediately on his release, while on his way to Versailles to give an account of his visit to India, he was shot by some unknown person. He was then only 37 years of age. His name is spelt in various ways both in French and English works and documents, but the writer just named states that the correct spelling is Vauquelain. Parkman, "Montcalm and Wolfe," gives it as Vauquelin.

James Hannay in 'Stewart's Quarterly' for July 1868, (St. John, N. B.) reproduces the Chevalier's account of the siege, of the authorship of which he appeared to be ignorant, though it had been in the same year printed by the Quebec Literary and Historical Society of Quebec.

The Quebec collection also contains the following documents, with respect to the second siege of Louisbourg:—

7. Memoir of M. Chevalier de Drucour on Louisbourg from 1754 to 1758; iv. 145-149. This is a brief account of the work done on the fortifications and outposts from 1754, and of the principal details of the siege of 1758. The complete narrative and journal of the siege by M. Drucour mentioned by Parkman and other authors, and in the "Can. Archives" (1887, cccxci) as "exceedingly interesting," is not given in the Quebec collection.

8. Letters from M. de St. Julien, who commanded the French troops at Kennington Cove (Cormorandière in the French plans) on the occasion of the English landing in 1758; iv. 159-161, 174-176, 193-195.

9. Letter of M. de la Houlière, king's lieutenant to the minister, 22nd June, 1758, referring briefly to the state of affairs at that date. Another from the same, 6th August, giving further details of the siege; iv. 162, 163, 176-186.

10. Number and condition of the officers and men of the French navy at Louisbourg, 30th July, 1758; iv. 196. These persons belonged to the vessels captured or destroyed during the siege.

11. Letter of M. Chevalier Desgouttes, brother of the officer commanding the French fleet in 1758; iv. 215-222. This letter was written on board the transport which carried the sick and wounded French officers and a number of other persons to France under instructions from Admiral Boscawen. It refers to the disposition of the inhabitants of Louisbourg, and of the officers and sailors of the fleet.

The annual reports on Canadian historical archives show what a large number of valuable documents bearing on the history of Cape Breton, and chiefly of Louisbourg, necessarily remain unknown in the Paris archives. M. Marmette, F.R.S.C., in the volume for 1887, gives an analysis of "La Correspondence Générale," which relates to Isle Royale and Ile St. Jean, and consists of forty-seven volumes in the Archives Coloniales de la Marine at Paris. This analysis takes up 110 pages of the volume, and extends from 1712 to 1758 inclusive. If Mr. Marmette's suggestions are carried out, and the Canadian Government grants a sum of money sufficient to copy all or the most valuable documents, much light will be thrown on the material and social condition of the residents of Louisbourg, and the principal settlements like Port Toulouse and Port Dauphin. We shall have to quote the Canadian archivist's words: "The details of the daily life of the stirring population—officials, officers, soldiers, fishermen and seamen—placed as sentinels at the entrance to the great river, between Canada and their distant motherland of France, a mother but too forgetful of her children beyond the seas." A few of these documents have been already printed in the collection of documents recently published by the Quebec Government, but the great bulk is unknown to the historical student. The following list will illustrate the value of these archives:—

1. Memorandum and plan indispensable in order to begin the fortifications of Louisbourg, 1714.

2. Memorandum about Ile Royale, with a sketch of the people and the establishments erected there, 1714.

3. Order on a memorandum by M. de Costebelle (governor), respecting disorders caused by the excessive number of taverns, 1716.

4. Order respecting the administration of justice in Ile Royale, 1717.

5. Order respecting the trade and fisheries of Ile Royale, of Cançeaux in Acadie and of Newfoundland.

6. Memorandum respecting the poor success of the efforts to induce the Acadians to emigrate to Ile Royale, 1717.

7. Unsigned memorandum respecting the benefit which would be derived from attracting the Roman Catholic Irish now living with the English in the neighbourhood of Ile Royale, towards the settlement of this portion, 1717.

8. List of the inhabitants engaged in fishing off Ile Royale, with the number of their boats, 1718.

9. M. de St. Ovide (governor), respecting the fortifications and the engineers, and the relations sustained with the English in Acadie, 1724.

10. Fishing and trade returns of the island in 1726.

11. The Company of La Boularderie for the opening up of Labrador (Bras d'Or) and Verderonne Island (Boularderie), 1732.

12. Police regulations respecting fishing and trading vessels at Louisbourg, 1732.

13. Ordinance respecting fishermen, 1733.

14. Statement of the lands granted in Louisbourg and Ile Royale. The harbour works. The fortifications and roads of Ile Royale. The public funds.

15. M. de St. Ovide to the minister informing him that the lighthouse light was kindled on the 1st of April, 1734, and was perfectly visible for six leagues out to sea, 1734.

16. Statement of the merchant vessels which have come to trade at Louisbourg from Canada, Martinique, and those that have been fitted out in the island as well for the unbroken voyage to Quebec as for the trade from port to port, in 1734.

17. Fishery and trade returns for 1736.

18. M. Verrier (engineer), on the condition of the work on the fortifications of Ile Royale, giving a description of Louisbourg at this period, 1736.

19. Critical condition of Ile Royale on account of the famine which reigns throughout the colony, 1737.

20. M. de la Boularderie and his establishment at Inganiche (Inganish), 1740.

21. Relations with the Indians of Ile Royale and vicinity, 1740.

22. Product of the fisheries in 1739. Trade carried on by the English at Ile Royale and Ile St. Jean. Naval works.

23. The news from Boston that the people are planning to reduce Louisbourg by famine, induce Duchambon and Bigot to ask the minister for an increase of the garrison. Duchambon was the king's lieutenant, in command on account of the death of the governor, Duquesnel. November 23rd, 1744.

24. Memorandum as to what remains to be done in order to complete the fortifications of Louisbourg. Feb. 8th, 1745.

25. Importance of Cape Breton to the English, as shown by the product of the French fisheries, 1748.

26. M. des Herbiers (governor), on the military buildings erected by the English at Louisbourg. French families which have remained at that place, 1749.

27. Letter respecting trade and fisheries, 1750.

28. M. Prévost (intendant) to minister, showing that the total number of refugee Acadians on Ile Royale and Ile St. Jean in one year (1750) amounts to 2,200 souls, 1751.

29. M. de Raymond (governor) and M. Prevost (intendant), respecting the sad plight of Ile Royale and Ile St. Jean, owing to food having become scarce, 1752.

30. Memorandum on Ile Royale by M. de Raymond and his voyage to Canada, June 12, 1752.

31. General enumeration of residences, barracks, guardhouses, powder magazines and provision stores in Louisbourg, 1753. [See App. XVI to this work.]

32. M. Franquet (engineer), on the fortifications and the defence of Louisbourg; nine letters, from May 15 to Nov. 16, 1757.

33. M. Marchault de la Houlière, commander of the troops, gives details respecting the surrender of Louisbourg, July 28, 1758.

34. Details respecting the siege of Louisbourg by M. Ardibus.

35. Reflections upon Louisbourg, Plaisance and the codfishery, Sept. 16, 1758.

36. Unsigned letter to minister blaming the sailors, and especially M. Desgouttes (admiral), for their conduct during the siege of Louisbourg, and, on the other hand, bestowing praises on the land forces. Sept. 19, 1758. Written at Rochefort.

37. Some thirty letters, official for the most part, respecting the siege of 1758. Some, like Drucour's journal, have already been cited by Murdoch, Parkman and Brown.

M. Marmette says in his preface that there still remain to be examined and summarized in the Colonial Archives of the Marine at Paris 119 registers, nearly every one containing at least one cahier on Canada, Acadie,

Ile Royale; 6 volumes of civil status of Ile Royale and Ile St. Jean; 34 cartons, each containing two or three records relating to the superior council, the bailiwick, criminal proceedings, etc., of Louisbourg; and lastly, 16 cartons, containing each, at least, two notarial registers of Ile Royale and of Canada. One of the cartons cited by Marmette contains a number of plans, chiefly of Louisbourg, its fortifications and environs; also of Ile Royale, about 1723.

In the second volume of "Histoire du Canada depuis sa découverte jusqu' a nos jours" par F. X. Garneau (4th ed. Montreal, 1882), Cape Breton obtains full recognition, on account of its importance after 1713, in relation to New France. Chapter iii, sixth book, (pp. 59-70) narrates its history from 1713 to 1744; chapter ii of the eighth book (pp. 169-189), the history of Louisbourg from 1744 to 1748; chapter iii of the ninth book (pp. 280-285), in part, the capture of Louisbourg in 1748. Garneau is always a French Canadian, inspired with the most decided partiality on the side of his countrymen, and consequently we must read his record of the old régime as that of a French historian. He gives no account of the siege operations of 1745, and contents himself with a meagre narration of the origin of the New England expedition, of the capture, and of its consequences. He devotes more space to the second siege, but he concludes by citing some words from a letter of General Wolfe to Major Wolfe, (ii. 285) in order to show that Louisbourg was, after all, but a wretched little fortress (bicoque). Yet this wretched little place, defended by a relatively small force, resisted for nearly fifty days the greatest fleet and army that England had ever assembled in America. Wolfe's letter was evidently written in bad humour—we all know his ill health made him exceedingly irritable—and is not even accurate, for he says Louisbourg has but one casemate on it—a mistake, since there are now visible the crumbling remains of four—certainly small in size, but still four in number. England and France did not consider Louisbourg a wretched little place, judging from the rejoicings on the one side and the dismay on the other. Garneau is obviously glad of an excuse, however weak, to underrate the importance of the capture, and exaggerate the strength of the defence. The "Cours d' Histoire du Canada" by the Abbé Ferland, professor of history at the University of Laval, (Quebec, 1861, 2 vols., 8vo) has a few references to Cape Breton and Louisbourg; ii. 395-396 (foundation of Louisbourg); 475-478 (taking of Louisbourg in 1745); 559-561, (taking of Louisbourg in 1758).

In "Histoire du Canada," etc., by the Abbé Brasseur de Bourbourg (Paris, 1852), there is a short description of Cape Breton (i. 244); an account of its resources (ii. 169) with a special reference to the Abbé Maillard (see *infra*, XIII.) and his death at Halifax; the foundation, capture and destruction of Louisbourg (i. 244, 245; 274, 277, 278; 293-295. He also gives a brief account of a visit paid to the ruins in 1815 by Mgr. Plessis, bishop of Quebec (ii. 136-138).

"Le Canada sous la Domination Française d'apres les Archives de la Marine et de la Guerre," by M. Dussieux, Professeur d'Histoiré à l'école impériale militaire de St. Cyr, (Paris, 1855 and 1862,) has short references to Louisbourg, (pp. 101, 102, 104-106, 190-193), a map "pour servir à l'histoire de la Nouvelle-France, &c.," and among the pièces justificatives (pp. 327-329.) "Représentations faites à M. le Chevalier de Drucour au Conseil de guerre tenu à Louisbourg le 26 Juillet, 1758, par M. Prévost, commissaire-général de la marine, ordonnateur, à l'île Royale."

X. English Works.—Memoirs and Sources of Information Respecting Louisbourg and the Two Sieges of 1745 and 1758.

Diverse opinions have been expressed with respect to the origin of the expedition of 1745. Brown in his "History of Cape Breton," p. 191, is of opinion that Mr. Robert Auchmuty, judge of the vice admiralty court of Massachusetts, was "the originator of the enterprise," but the editor of the "Nar. and Crit. Hist of Am." (v. 434) throws doubt on his claim of priority by showing that he developed his plan in an article on "The Importance of Cape Breton to the British Nation," which was published in the "Gentleman's Magazine" only in July, 1745,—"the same number in which was also printed the news of the attack and capture." Dr. Winsor goes on to say that "when the paper was reprinted in a thin folio tract shortly afterwards, he, or some one for him, emphasized his claim to the suggestion in the title itself, as follows: — The Importance of Cape Breton to the British Nation, humbly represented by Robert Auckmuty [sic], judge, etc., in New England, N. B. Upon the plan laid down in this representation the island was taken by Commodore Warren and General Pepperrell the 14th of June, 1745" (London, 1745). Though the judge's claim cannot be substantiated, but is even contradicted by the date of the publication of his essay, it is not at all unlikely that he was among those who suggested and supported the enterprise at a time when Louisbourg was in everybody's mouth. A paper of the title just cited, ("Nar. and Crit. Hist. of Am.," v. 454, *n.*) as printed in the 'Mass. Hist. Coll.,' v. 202, is dated "From my lodgings in Cecil street, 9 April, 1744." A MSS. copy is in the Mass. Hist. Soc. library (Louisbourg Papers). The third ed. of "Curwen's Journal," edited by Ward (1845), contains a sketch of his life.

The fifth volume of the "Nar and Crit. Hist. of Am." devotes chap. vii to "The Wars on the Seaboard: The Struggle in Acadia and Cape Breton," by Charles C. Smith, of the "Mass. Hist. Soc.," with a short critical essay by

the same. The most valuable feature of this chapter—for the references to Cape Breton and the two sieges are necessarily meagre—are the notes by the editor, Dr. Winsor, on the authorities relating to Louisbourg, and the island generally. It is the only bibliography that has yet appeared on the subject of the island from 1745–'58. The strong feature of these notes is necessarily the complete references to the literature on the taking of Louisbourg in 1745, the collection of books and documents in Harvard University, and other institutions in New England being very complete.

"The History of New Hampshire" by Jeremy Belknap (Philadelphia and Boston, 1784-1792). It contains a very readable and accurate account of the siege of 1745, which is particularly valuable since the author had superior opportunities for obtaining direct information from the participants in the famous exploit. He was the ablest historian New England produced in early times, and had — to quote the words of William Cullen Bryant — "the high merit of being the first to make American history attractive." See an article on his merits as an historian in the 'Atlantic Monthly,' for May, 1891.

"Accurate Journal and account of the proceedings of the New England land forces, during the late expedition against the French settlements on Cape Breton to the time of the surrender of Louisbourg." (Exon, 1746). The manuscript of this work, according to the "Nar. and Crit. Hist.," (v. 437) was sent to England by Pepperrell to one of his friends, and as printed was attested by Pepperrell, Waldo, Gridley and others. According to the same authority it appeared as "An accurate and authentic account of the taking of Cape Breton in 1745," London, 1758; and in the 'American Magazine,' 1746; and with "some curious verbal differences," as an appendix to a letter from W. Shirley, Esqr., to the Duke of Newcastle, with a "Journal of the Siege of Louisbourg," (London, 1746). It was reprinted twice in Boston in 1746 on the authority of the legislature. The full title of the copy in the parliamentary library at Ottawa is this: "A letter from W. Shirley, Governor of Massachusetts Bay to His Lordship the Duke of Newcastle, with a 'Journal of the Siege of Louisbourg' and other operations of the forces during the expedition against the French settlements of Cape Breton, drawn up at the desire of the Council and House of Representatives of the Province of Massachusetts Bay and approved and attested by Sir W. Pepperrell and other principal officers who commanded in the siege the expedition." (London 1746.) A copy of the same ed. is also in the present author's possession.

"Journal of the late siege by the troops of North America against the French of Cape Breton," by Colonel James Gibson, who took part in the siege. London, 1745. It contains a plan of the siege, reproduced in a reduced form in the "Nar. and Crit. Hist. of Am.," v. 437. It also appeared in Boston in 1847, as "edited by Lorenzo D. Johnson, under misleading title of 'A Boston Merchant of 1745.'"

"A particular account of the taking of Cape Breton by Admiral Warren, and Sir William Pepperell, with a description of the place and the articles of capitulation. By Philip Durell, Esqr., Captain of His Majesty's ship *Superbe*. To which is added a letter from an officer of Marines." (London, 1745.)

"The importance and advantage of Cape Breton considered in a letter to a member of parliament from an inhabitant of New England." (London, 1746.)

"Two letters containing some further advantages and improvements that may seem necessary to be made on the taking and keeping of Cape Breton." (London, 1746.)

"The importance and advantage of Cape Breton, truly stated and impartially considered, with proper maps," (London 1746.) The authorship has been ascribed to William Bollan, a friend of Shirley, and is also believed to have been inspired by W. Vaughan, who, it says, "had the honour of reviving, at least, if not having been the original mover or projector" of the expedition. The maps are Bellin's.

"The great importance of Cape Breton demonstrated and exemplified by extracts from the best writers, French and English." (London, 1746). It reproduces Bellin's map and plan from Charlevoix.

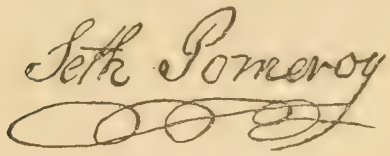
"An accurate description of Cape Breton, Situation, Soil, Ports, &c., its importance to France, but of how much greater it might have been to England, with an account of the taking of the city by the New England forces under General Pepperrell in 1745." (London, 1755).

"Memoir of the principal transactions of the last war between the English and the French in North America, from 1744 to the conclusion of the Treaty of Aix-la-Chapelle, containing in particular an account of the importance of Nova Scotia and Cape Breton to both nations." (London and Boston, 1758).

Dr. William Douglass, a Scotch physician of Boston, published in 1747, in quarterly numbers, "A Summary, historical and political, of the first planting, progressive improvements, and present state of the British settlements in North America; with some transient accounts of the bordering French and Spanish settlements." The numbers of this summary were subsequently collected in two volumes, published at Boston in 1749 and 1751, and in London in 1755 and 1760. He was a man of strong prejudice, and had a violent antipathy to Shirley (See "Nar. and Crit. Hist. of Am.," v. 158, 159). He gives an account of the Louisbourg expedition, which he calls "this infinitely rash New England expedition, though beyond all military or human probability successful." Douglass's portraiture of Admiral Knowles, the irascible governor of Louisbourg, whose conduct in the Boston impressment riots made him

very unpopular to Bostonians, drew upon him an action for libel, and he felt compelled to make a forced apology in the preface to the volume of 1749.

The Massachusetts Historical Collections, (i. 13-60, 120; x. 313), Provincial Papers of New Hampshire, (v., 931, etc.), Rhode Island Colonial Records (v.), Colonial Records of Connecticut (ix.), Pennsylvania Archives (i. 667), New England Historical and Genealogical Register (v. 88; xii. 263; xix. 225, &c.) contain a large amount of miscellaneous official and other papers bearing on the origin and preparations for the expedition. Seth Pomeroy left a journal of the siege which is quoted by George Bancroft, but it is not printed. See "Nar. and Crit. Hist. of Am.," v. 437.



The Belknap and Pepperrell Papers, (16 vols.) of the Massachusetts Historical Society at Boston, contain a most valuable collection of the leading official documents relating to the siege of Louisbourg, and the events preceding and following the taking of the fortress. One volume, Louisbourg papers, is especially important.

The reader may also consult Curwen's Journal, edited by Ward (Boston, 4th. ed., 1864), which contains a sketch of the island battery, reproduced by "Nar. and Crit. Hist. of Am.," v. 448. Also Curwen's Letters in Essex Institute, Hist. Coll. iii. 186; Craft's Journal in same, iv. 181; Adonijah Bidwell, chaplain of the fleet in N. E. Hist. and Gen. Reg., April, 1873; Wolcott's J. in Collections of the Con. Hist. Soc. i.; Hunt's Merchant's Magazine, for July, 1858, which has Ward's account of Pepperrell; Magazine of Am. Hist., Nov., 1878; Mr. J. R. Bartlett's Naval History of Rhode I., in Hist. Mag. for 1870; S. G. Drake's "Five Years' French and Indian Wars" (Albany 1870); C. Hudson's N. E. Hist. and Gen. Reg., Oct. 1870, giving from the Belknap Papers a list of all the commissioned officers in the expedition (See T. H. Higginson's note, in "Mem. Hist. of Boston," ii. 117); Hudson, in the same for April 1868, and July, 1871, names of the soldiers; Potter in N. H. Adj. Gen.'s Rep. for 1866 (pp. 61-76), subsequently published a "Military Hist. of N. H.," gives a list of the soldiers from N. H. ("Nar. and Crit. Hist. of Am.," v. 438). Of the first Louisbourg expedition there are no rolls except as made up in copies from the Pepperrell and Belknap papers in the library of the Mass. Hist. Soc. (*Ib.* 165.)

The reader may also refer to the following works for short accounts of the event of 1745:—

1. "History of Massachusetts Bay," by Thos. Hutchinson. (Boston, 1749, 1767, 1795; London, 1750, 1768, 1828.)

2. "Continuation of the History of the Province of Massachusetts Bay," by Richard Minot. (Boston, 1798.)

3. "An Introduction to the History of the Colonies, giving from the State Papers a comprehensive view of the origin of their revolt," by George Chalmers. (Boston, 1845, the first ed. of 1782 being suppressed, "Nar. and Crit. Hist. of Am.," V. 353).

4. "Life of Washington," by Chief Justice Marshall. (Philadelphia and London, 1804-07).

5. "History of the United States," by James Grahame. (London, 1827, 1836; New York, 1830; Boston, 1833, 1845; Philadelphia, 1845, 1846 and 1852).

6. "History of Maine," by W. D. Williamson. (Hallowell, Me., 1832 and 1839).

7. "Life and times of Sir W. Johnson," by William L. Stone & Son. (Albany, 1865).

8. "Compendious History of New England," by J. Gorham Palfrey. (Boston, 1884, in a complete form, the volumes having been first issued in 1866, 1872, 1873, "Nar. and Crit. Hist. of Am.," V. 161, 162.)

9. "Popular History of the United States," by Gay. (N. Y., 1876-80).

John S. Barry, "History of Massachusetts," (Boston, 1855-57, gives a clear account in 15 pages (139-155), specially valuable for the authorities he cites. The "Memorial History of Boston," (Boston, 1880-81, vol. ii.) has a chapter devoted to French and Indian wars, by T. W. Higginson, in which there are some interesting notes to the short account given of the siege, and a number of autographs of Warren, Pepperrell, and others who took part in the expedition. The volume has for a frontispiece a portrait of Shirley, his coat of arms, his residence at Roxbury and the Louisbourg cross given in the text of this work.

The following represent the religious phase of the affair of 1745:

1. "Extraordinary events the doings of God and marvellous in pious eyes. Illustrated in a sermon at the South Church in Boston, N. E., on the General Thanksgiving, Thursday, July 18, 1745, occasioned by taking the city of Louisbourg on the Isle of Cape Breton, by N. E. soldiers, assisted by a British squadron." By Thomas Prince, M. A., and one of the pastors of the said church. Psal. xcviii. 1.2. (Boston, London, and Edinburgh, 1745, 1746).

2. "Marvellous things done by the right hand and holy arm of God in getting him the victory," by Rev. Charles Chauncey, brother-in-law of General Pepperrell (London and Boston.)

3. "A brief and plain essay on God's wonder working Providence for New England in the reduction of Louisbourg," by S. Niles, *in verse.* (London, 1747).

The Reverend Thomas Prince was a memorable figure in the history of those times. He was a voluminous author besides an eminent if prolix preacher. (See "Mem. Hist. of Boston" for an account of his writings and services, ii. 401, 409, 425; portrait, ii. 221; his "Chronological Hist. of N. E.," i. xviii; ii. 426; his library, ii. 221, 426. Also "Nar. and Crit. Hist. of Am.," v. 121, 137, 163, etc.) Another of his sermons is: "The Salvations of God in 1746, in part set forth in a sermon at the South Church in Boston, Nov. 27, 1746, being the day of the Anniversary Thanksgiving in the Province of Massachusetts in N. E., wherein the most remarkable Salvations of the year past, both in Europe and North America as far as they come to our knowledge, are briefly considered" (Boston, 1746). In this last sermon he makes special mention of the providential interposition which saved the English colonies from the threatened attack by the Duke d'Anville's fleet (See *supra*, sec. VI.) In the first sermon of 1745, Mr. Prince narrates the leading events from the commencement of the N. E. expedition until the capture of Louisbourg, to show that "no one in common reason can deny a *particular Providence* in this great affair." His closing words are that "as 'twas one of the chief disgraces of Queen Anne's reign to resign *this Island* to the *French*, it is happily one of the glories of King George the Second's to recover it to the *British* Empire." I have not come across any sermon of this divine, explaining the giving up of Cape Breton in 1748 by the same George II., on whose glories he expatiated in 1745.

"A voyage to South America describing at large the Spanish Cities, Towns, Provinces, etc., in that extensive continent, undertaken by command of the King of Spain," by Don George Juan and Don Antonio de Ulloa, both captains of the Spanish navy, fellows of the Royal Society of London; members of the Royal Academy of Paris, &c. Translated from the original Spanish, (3rd. ed., London, 1772, 2 vols.) The translation in my possession is by Mr. John Adams of Waltham Abbey, "who resided several years in those parts." This work is cited because it contains an interesting "account of the harbour and town of Louisbourg and the taking of it by the English (1745); together with some particulars relating to the French fishery, and the trade carried on there." (See vol. ii. cap. 7.) The complete work in the original Spanish is relatively expensive, 100 fr. in Dufosse's Cat.; it is in 5 vols. 4to., (Madrid, 1748) — the fifth volume being now rare. The author gives an account of the capture of the *Délivrance*, by the English fleet in 1745.

In "The Works of James Houston, M.D., containing memoirs of his life and travels in Asia, Africa, America and most parts of Europe, from the year 1690 to the present time" (London, 1753), there is a letter from a correspondent of the author, written at Louisbourg, Nov. 20, 1745, and giving a short account (pp. 357-385) of the taking of the fortress in that year. The name of the writer is not mentioned, but the style of the narrative is that of the author himself, and we have still more reason to believe that the correspondent is imaginary when we read the closing pages which refer to the value of Cape Breton to England and the necessity of retaining it in her possession. The arguments have a striking resemblance to those we find in the pamphlets which were issued after the taking of Louisbourg, and to which reference has just been made. In all probability the author compiled this part of the book from the current pamphlets of the day. (See *infra*, App. XVIII.) The writer, in showing the importance of Cape Breton, states that at least 3,400 men, 500 shallops, 60 brigantines, schooners and sloops were employed annually in the fisheries from the Gut of Canso to Louisbourg, and thence to the northeast part of the island. The annual catch of fish is estimated at 186,000 quintals, and the trade required ninety-three ships, with an aggregate of 1,800 men. Other statistics are given to show the great importance of Cape Breton as an entrepot for the fisheries of the gulf. Houston was a Scotch adventurer who received a good medical education, and passed most of his life as surgeon to the Assiento company, and as a trader and negotiator in Central America and the Spanish main. In addition to the memoir cited here there were two previous editions of his memoirs published in London in 1747, one under the title of "The Memoirs of the Life and Travels of James Houston," with the name of Jacob Bickerstaff, and the other, "Dr. Houston's Memoirs of his own Life-time." (See Sabin's Dictionary, viii. 467.)

In the fourteenth volume of the voluminous collection of voyages, known as "Histoire Générale des Voyages, etc.," by the Abbé Prévost, the author of "Manon Lescaut" (Paris, 1746-1789), there is an account of the "Etablissement des François dans l'Ile Roïale, autrefois le Cap Breton," extending over twelve pages (671-684). It is borrowed almost entirely from Charlevoix and De Ulloa—the errors of the latter being reproduced. The author was a mere compiler and editor in the case of this collection of voyages. He does not appear to have availed himself of the opportunity he must have had of consulting the colonial archives at Paris, which contained abundant material for an accurate description of Louisbourg, and the resources and condition of Cape Breton. He does not even give a sketch of the fortress, though his work contains many elaborate plans of places in America, Asia and Africa. He has contented himself with a map, by N. Bellin, of Acadie and Ile Royale, which is thirteen years later than that given in Charlevoix by the same engineer. Several places are spelt differently; for instance Miray becomes Miré, and Gabori is Gabaru. The strait of Canseau is spelt Fronsac, showing how long Sieur Denys's title clung to this well known "gut." Volumes xii-xv are devoted to America in this collection of voyages, the

first nine volumes of which comprised the English collection known as "Astley's Voyages" (London, 1745-1747). Before the completion of the work Abbé Prévost died, and four volumes were added by Querlon and De Leyre. (See "Nar. and Crit. Hist. of Am.," i. p. xxxv, for references to other editions.)

"The Life of Sir William Pepperrell, Bart., the only native of New England who was created a baronet during its connection with the mother country," by Usher Parsons (London and Boston, 1856). This work is the best and only complete life of the famous leader of the New England expedition. In his preface the author states that the idea of the work originated in the fact that he came into possession of a package of papers, "which had been exposed in an old shed on the Pepperrell estate, probably for half a century." They had been saved from destruction by Colonel George Sparhawk, allied by marriage to descendants of Sir William. After much difficulty he accumulated sufficient material to write a biography. The plan of Louisbourg is taken from the early edition of Bancroft's "History of the Colonization of the United States," as Dr. Parsons came to the conclusion, after a personal inspection of the ruins of that city, and after an examination of several drawings of it and its fortress, that it "admitted of no improvements." The "Narrative and Critical History" (v. 448) says that "it follows an English plan procured by Mr. Bancroft in London, and closely resembles the sketch owned by a descendent of Pepperrell and herewith given" (p. 437). This last plan is owned by Mrs. Howard, of Brooklyn, N.Y., and is considered authentic.

Sir W. Pepperrell's funeral sermon was preached by his former pastor, Rev. Dr. B. Stevens, and as Lady Pepperrell published it, and sent a copy to every member of the house and council of Massachusetts, it is still easily obtained. (See Parson's "Life," p. 321.) It has for title "A Sermon occasioned by the Death of the Hon. Sir W. Pepperrell, Bart., Lieut.-General in Her Majesty's service, etc., who died at his seat in Kittery, July 6, 1759" (Boston, 1759, pp. 30). It has a portrait inserted in some copies.

"Capture of Louisbourg by the New England Militia" is the title of a monograph that appears in the March, April, and May numbers of the 'Atlantic Monthly' for 1891, from the pen of Dr. Francis Parkman, who, in this essay, as in all his other productions, displays that elegance of style, thoroughness of research, and judicial spirit that are eminently his characteristics as an historian. He uses the testimony of a curious little work, not before cited by the historians of Louisbourg. It is the "Lettre d'un Habitant de Louisbourg, contenant une Relation exacte et circonstanciée de la Prise de l'Isle Royale par les Anglais. A Quebec chez Guillaume le Sincère, a l'Image de la vérité, 1745." Dr. Parkman says that "this little book, of 81 printed pages, is extremely rare. I could study it only by having a literatim transcript made from a copy in the Bibliothéque National, as it was not to be found in the British Museum. It bears the signature "B. L. N." and is dated "a" . . . . ce 28 Aout, 1745. The imprint of Quebec is evidently intended as a mask, the book having, no doubt, been printed in France. It criticises Duchambon severely, and makes him mainly answerable for the disaster."

As these proofs are passing through my hands, Dr. Parkman's new work, "A Half-Century of Conflict," which fills up the gap between his "Count Frontenac and New France under Louis XIV" and his "Montcalm and Wolfe," is announced for early in May. It covers much of the ground over which I have gone, very briefly on the whole, in this work on Cape Breton. It contains chapters on "Louisbourg and Acadia" (i. c. 10); on "Louisbourg Besieged and Taken" (ii. cc. 5 and 6); and on "The Expedition of the Duc d'Anville" (ii. c. 7).

In 'Harper's Monthly' for 1864, vol. xxviii, p. 354, will be found an interesting narrative, suitable to the readers of a popular magazine, of the siege of Louisbourg in 1745, by J. T. Headley. The writer is accurate on the whole, but he makes an egregious mistake, when he states (p. 356) that "the Rhode Island troops, numbering only a few hundred, were already" at Canso, when the Massachusetts forces arrived there on the first of April—the fact being, that they never sailed or took part in the expedition. The statement that one-half of the rich treasure taken in the Délivrance and other vessels captured by the fleet, went to the captors, is misleading. The Crown and the English fleet alone divided the spoils between them.

In the 'Report of Canadian Archives' for 1886, (pp. vii-xii) Mr. Brymner, chief archivist, has a summary of the leading facts relating to the capture of Louisbourg in 1745. It is generally accurate and impartial. It contains the plans (Note A.) suggested by General Waldo to Pitt, for the reduction of the fortress in 1758, and "dearly drawn from his experience while in command of the land forces, at the reduction of the same place in 1754." The two maps that accompany the report, are made up from Gridley's and other maps in Jefferys' French Dominions.

In the fifth volume of the 'Transactions of the Royal Society of Canada' (sec. ii), there is a long paper on the "First Siege and Capture of Louisbourg" by the Honourable Sir Adams G. Archibald, P.C., K.C.M.G., D.C.L., who, after a long life spent in the public service, has devoted the leisure of his declining years to historical studies. This paper is an interesting contribution to the literature on the subject.

"The taking of Louisbourg in 1745," is a short account of the siege by Samuel Adams Drake, published in a series describing "Decisive Events in American History," (Boston, 1891). It has no special historic value since it is simply a narrative made up from the ordinary sources of information available to every one on the subject.

Smollett, in "The History of England from the Revolution to the death of George the Second"—a continuation of Hume's history—has only a page and a-half on the operations of 1745, and falls into the error of saying that "they were wholly conducted by the engineers and officers who commanded the British marines." Parkman ('Atlantic Monthly' for May, 1891) puts it correctly when he states that "the whole work of the siege fell upon the land forces, and though it had been proposed to send a body of marines ashore, this was not done. Three or four gunners, intended, in the words of Warren, 'to put your men in the way of loading cannon,' were his only contribution to the operations of the siege." (See letter of Warren to Pepperrell, 11th May, 1745, in which he showed he had no men to spare. *Ib.* p 629, *n.*) Smollett was, however, fully aware of the importance of Cape Breton, and of the ignominy of the peace which gave it up "in exchange for a petty fortress in the East Indies." Smollett gives more space, pp. 299-304, (London ed. of 1796) to the taking of Louisbourg in 1758, and describes "the noisy expressions of triumph and exultation" in London.

"Exodus of the Western Nations," by Viscount Bury, M.P. (London, 1865, 2 vols.). In the second volume (pp. 179-186) a brief sketch of the siege of 1745 is given, but while it is incorrect in some particulars it does not fail to do full justice to the enterprise and bravery of the New Englanders. We know, however, that Warren had not actually communicated with Pepperrell before the latter's preparations for sailing were complete, or had arranged for a rendezvous at Canso. As a matter of fact, Pepperrell sailed for Canso despite the knowledge that Warren had refused to co-operate with him. Vaughan did not attack the royal battery and force the French to spike their guns. The garrison did not become mutinous during the siege, but did their duty courageously. Lord Bury was civil secretary for 1854-5, under Sir Edmund Head, while governor-general of Canada, and married a daughter of Sir Allan McNab, who took for many years a leading part in Canadian affairs. The work in question is a history of colonization, quite readable, but sketchy and not always accurate in its details. Another example of his inaccuracy is his statement that the Duc d'Anville died at sea. (See *supra*, sec. VI.)

The taking of Louisbourg, in 1745, appears to have inspired a poet in Nathaniel Ames's "Almanac" (Boston, 1746) to indulge in this poetic burst:

> "Bright Hesperus, the harbinger of day,
> Smiled gently down on Shirley's prosperous sway,
> The prince of light rode in his burning car,
> To see the overtures of peace and war,
> Around the world; and bade his charioteer,
> Who marks the periods of each month and year,
> Rein in his steeds, and rest upon high noon,
> To view our victory at Cape Breton."

The victory is also commemorated in the 'Gentleman's Magazine' for July, 1745, in several stanzas, entitled a "Hymn to Victory," of which the following is a specimen verse:

> "Beyond the wide Atlantic sea
> She rises *first* to crown our toils;
> Thither to wealth she points the way,
> And bids us thrive on Gaelic spoils."

The inspiration in this case is decidedly of a mercenary character, and does not take as lofty a flight as the New England poetic description of Hesperus smiling on the victory. Cape Breton does not appear to have called for poetry in 1758. It was soon forgotten in the taking of Quebec and the death of Wolfe, to whom many poetic tributes were paid. See Hawkins's "Pictures of Quebec" (Quebec, 1834), 379, 387, 388.

In N. Hawthorne's charming stories of history and biography for young people, "The Whole History of Grandfather's Chair," there is a short chapter on the preparations in Boston in 1744-45 for the expedition against Louisbourg (see pp. 110-116, Patterson's Edinburgh ed. of 1885), and of the rejoicings when the news of the victory arrived in the capital of New England. A little work of this style hardly calls for criticism, but it is noteworthy that, though the author states in his preface he "has endeavoured to keep a distinct and unbroken thread of authentic history," he ignores the second taking of Louisbourg in 1758, though the first in the series of great events that relieved the Thirteen Colonies of fears of French aggression, and gave Canada to England. See also Hawthorne's "Fanshawe, and Other Pieces" (Boston, 1876), a work of little merit, but noteworthy here because it contains a sketch of Pepperrell and of the expedition of 1745.

In 'The New England Magazine' (Boston) for October, 1891, there is a short paper (pp. 260-265), "A Glimpse of the Siege of Louisbourg," by S. Frances Harrison, a Canadian poet, better known as "Seranus." As is very common with most of the English writers, Louisb(o)urg is anglicized by leaving out "o"—an inaccuracy, it seems to me, in the case of a French name, especially in an historic paper. It occurs, however, in the maps and memoirs by Gibson, Waldo, Gridley, and the New England writers generally of last century. Mrs. Harrison's notes—the

paper is really nothing more—are chiefly made up from the letters of Brigadier-General Waldo, third in rank among the officers of the New England expedition of 1745. Waldo, it appears, had a claim to large grants of land in Nova Scotia, originally belonging to Sir William Alexander, earl of Stirling. He proposed in 1730 to the English government to settle the grant, if his claims were acknowledged—the first settlement to be made "near St. Mary's Bay, which is the nearest good land to the fort of Annapolis (Royal), by which the said settlements and the garrison, in case of any emergency, may be mutually serviceable to each other." The British government, however, never acceded to his propositions, which would have made him one of those great landlords, called patroons or manorial lords, who for so long a time occupied so large a portion of the lands of New York. The name has been perpetuated in a fine county of Maine, of which Belfast is the principal town, and the noble Penobscot Bay is the most picturesque feature. In Drake's "Nooks and Corners of the New England Coast" (pp. 60, 61) there is an account of the Waldo or Muscongus patent, which extended over a good part of this county. (See Williamson's "History of Maine"). Waldo's daughter was to have married Sir W. Pepperrell's only son, Andrew, but the match never came off, through the indifference of the latter, whose eccentric conduct is inexplicable, even after the attempted explanations of his apologist, Parsons (see "Life of Pepperrell," 220-229), who gives an account of the whole affair. Appleton's "Cyclopædia of American Biography" falls into an error when it says both Samuel Waldo and his father Jonathan took part in the Louisbourg expedition. It was the son who was brigadier-general, and the father was never connected with the expedition. (See List of Officers of the Expedition, *supra*, sec. IV; Parson's "Life of Pepperrell, 349, 350). A portrait of Waldo is given in Joseph Williamson's "Belfast," p. 44. The volume of "Canadian Archives" for 1886 (p. cliv, note B) gives a summary of the papers relating to the Waldo claim in Nova Scotia. Mrs. Harrison's references to Louisbourg call for no particular comment, except that she falls into an error in saying that the city and fortress extended "about *five* miles each way, from north to south and from east to west," since the circumference of the whole place was hardly two miles and a half. (See *supra*, sec. II.)

Accounts of the siege of 1758 are to be found in the despatches of Amherst and Boscawen to Pitt, extracts from which were published (see "Nar. and Crit. Hist. of Am." v. 464) as a "Journal of the landing of his majesty's forces on the island of Cape Breton, and of the siege and surrender of Louisbourg," a third edition of which was printed in 1758 in Boston. The N. Y. Hist. Society Col. (1881) contain "An authentic account of the reduction of Louisbourg in June and July, 1758, by a Spectator" (London, 1758). Entinck in his "General History of the Late War" (London, 1764) used this excellent description without acknowledgment (see Parkman, "Montcalm and Wolfe," ii. 81). Thomas Mante, in his "History of the Late War in North America and the Islands of the West Indies, including the campaigns of 1763 and 1764 against His Majesty's Indian Enemies," (London, 1772) prints the so called official "Journal of Amherst," which appeared first in the 'London Journal' and in other periodicals of the time. Mante also gives a very intelligible plan of the siege operations. He was an engineer officer, and was major of a brigade during the campaign of 1764. His work which contains 18 large well executed maps, principally by Thos. Kitchin, has a high reputation and copies are now so rare that they bring from $70 to $125 according to their condition; Quaritch sold a copy in 1891 for the latter sum. The copy in the possession of the present writer belonged to the library of Baron Mulgrave, P. C., who died in 1798, and is complete and unsoiled in every particular. The topography of the country around Louisbourg harbour is remarkably well marked in Mante's plan. The first volume of John Knox's "Historical Journal of the Campaigns for years 1758, 1759, and 1760 &c.," (London, 1760, 2 vols.) contains a readable account of the siege, and is especially valuable for the numerous authentic official documents cited. See also J. Montresor's Journal, N. Y. Hist. Soc. Coll. (1881).

Other authorities on the siege cited by Parkman and the editor of the "Nar. and Crit. Hist." are the following: "The Life of Major General James Wolfe," by Robert Wright, (London, 1864) which contains much original matter in the shape of Wolfe's correspondence. "The Grenville correspondence" (vol. i, pp. 240-265) and Walpole's "Memoirs of George the Second" (2nd ed. vol. iii. 134) contain useful material for the historical writer. Parkman refers also to the "Diary of a Captain or Subaltern in the army of Amherst at Louisbourg," found in the garret of an old house at Windsor, Nova Scotia, on an estate belonging in 1760 to Chief Justice Deschamps, and the use of which he owed to the kindness of Mr. George Wiggins of the same place.

Dr. Francis Parkman's work on "Montcalm and Wolfe" (Boston, 1884, 2 vols.,) already referred to in the foregoing paragraphs is a spirited account of the capture of Louisbourg. The narrative is found in the 19th chapter, vol. 2, and contains 30 pages with an eclectic map, which is very clear though drawn on a small scale. As usual in his works, the author cites at the end of the chapter the principal authorities which he has consulted.

"A History of Nova Scotia or Acadie," by Beamish Murdoch, Q. C., (Halifax, N. S., 1865-1867, 3 vols.) devotes chapters v and xxiii of the second volume to descriptions of the sieges of 1745 and 1759. This work is valuable as an accurate compilation of original authorities, but it can lay no claim to literary skill or style. The account of the siege of 1758 is taken mainly from Entinck.

"The History of Acadia from its first discovery to its surrender to England by the Treaty of Paris," by James Hannay (St. John, N. B., 1879,) is distinguished by the literary merit wanting in the former work, but the author has strong prejudices against the Acadians. In chapters xviii and xxiii there are short readable accounts of the sieges of 1745 and 1758.

"A History of the Island of Cape Breton with some account of the Discovery and Settlement of Canada, Nova Scotia and Newfoundland," by Richard Brown, F. G. S., F. R. G. S., (London, England, 1869) is the only complete history that has ever been written of the island. It is a conscientious effort of a gentleman who lived many years of his life in Cape Breton as manager of the largest and oldest association engaged in the working of the valuable mines of Sydney. He was a man of considerable scientific knowledge, and devoted the closing years of his life in London to the writing of this work and to scientific studies. He had access to the English archives, but does not appear to have made any effort to use the vast amount of material to be found in Paris. As it is, however, the work is fair and accurate. It reproduces Thorne's map of the Atlantic (1527); Mercator's map of the Gulf of St. Lawrence (1569); Champlain's (1632); Denys's (1672); an excellent profile of the walls of Louisbourg; plans of the harbour and vicinity and of the second siege, as well as a large modern map of the island.

"An Historical and Statistical Account of Nova Scotia," by Thomas C. Haliburton, barrister-at-law and member of the house of assembly of Nova Scotia. (Halifax, published by Joseph Howe, 2 vols., 1829.) The author will be best known for his famous humorous creation of "Sam Slick." The first volume contains the history, and the second the statistical account. Like all of the judge's works it is written in a pleasant style, though in the times in which he wrote he had not access to many original documents—not even to those in the Nova Scotia archives, strange to say—and consequently the book is not distinguished by any deep historical investigation. Chapters 3 and 5 of the first volume give a brief narrative of the two sieges of Louisbourg. The account of the siege of 1758 is taken almost verbatim from Smollett's history. In the second volume (pp. 201-262) there is a graphic description of Louisbourg in 1728-9, and of the natural features of the island. The work is also memorable as the first ambitious historical effort of a Nova Scotian. Indeed in many respects it still merits a high place among Canadian histories. It is noteworthy that the printer of the book was a famous Nova Scotian, the Honourable Joseph Howe, printer, poet and statesman; the father of responsible government in his province, who began life at the composing case, and died in the government house at Halifax, a lieutenant-governor—in the same old stone government house to which he had been denied admittance in the days of Lord Falkland, a royal governor, who showed his unfitness for his position, and was the last of the old English officials who constantly interfered and had preferences in provincial politics.

C. Roger's "History of Canada, etc." (Quebec, 1856) has a short account of the siege of 1745, pp. 39–43.

"The History of the United States," by George Bancroft (the latest revised edition of which appeared in 1888 in New York) contains short accounts of the two sieges in the second volume (pp. 305-310, 484, 485). The author devotes, as it might be expected, the larger space to the memorable event of 1745.

"The History of Canada," by W. Kingsford, LL.D., F.R.S. Can., (Toronto and London, 1887-1890, 4 vols.) contains an account of the siege of Louisbourg (iii. 309-324) which is accurate and does justice on the whole to the men of New England, though it was hardly necessary for him to dwell on the insulting language of Commodore (not then admiral) Knowles, who succeeded Warren as governor, in reference to the habits of the captors of the fortress. Knowles was a surly sailor who was in a chronic ill-humor during his residence in the island, and devoted himself to give the worst possible account of its resources, its people and everything connected with it. As I have already said (*supra*, sec. VIII.) his prejudiced accounts of Cape Breton are believed to have had much to do with the readiness with which England ceded the island in 1748. In the fourth volume of his work (chapter viii, pp. 120-142), Dr. Kingsford gives an excellent account of the siege of 1758, and a true estimate of the importance of an event "which was the first gleam of triumph reflected on the British arms in America."

"The Conquest of Canada," by the author of "Hochelaga" (London, 1849, 2 vols.), contains a short account (ii. 138-143) of the second siege, but the even more memorable event of 1745 is disposed of with the words: "In 1745, the year when the power of France in Europe was exalted by the splendid victory of Fontenoy, a dangerous blow was struck at her sovereignty in America by the capture of Louisbourg, and with it the whole island of Cape Breton, by the New Englanders under Mr. Pepperrell aided by Admiral Warren." The author was George Warburton, who belonged to the British army, and was member of parliament for Harwich. He died by his own hand, and his works were edited by his better known brother, Eliot, the author of "The Crescent and the Cross," who perished on the "Amazon" when she was destroyed by fire in 1852, while he was on his way to explore the isthmus of Darien.

In "Hochelaga, or England in the New World" (London, 1846-1851, 2 vols.), which was also written by the unfortunate George Warburton, and edited by his brother Eliot, we have a few pages devoted to a short historical and descriptive sketch of Cape Breton (pp. 325-330, 4th ed.). He pays his tribute to the New England expedition

in the words: "In 1745 an expedition of the always brave, and then loyal colonists of England . . . took the stronghold of Louisbourg in a very gallant manner."

In Hildreth's "History of the United States" (New York) three pages are devoted to the New England expedition of 1745, and less than a page to the siege of 1758. (See vol. ii. 394-397, 482.)

In the "Carter-Brown Catalogue" (iii. 1299) there is mention of a "Letter to a great M———r [Pitt,] on the prospect of peace, wherein the demolition of the fortifications of Louisbourg is shown to be absurd, the importance of Canada fully refuted, the proper barrier pointed out in North America, etc." (London, 1761). This is one of the numerous essays and pamphlets that appeared between the fall of Quebec and the Treaty of 1763, with reference to the respective values of Canada and the West India Islands, and the advisability of retaining such places as Gaudaloupe in preference to the present Dominion. (See Bourinot, "Comparative Studies in Canadian Politics," 'Trans. Roy. Soc. Can.,' vol. viii, pp. 39-40.)

Reference to the importance of the taking of Cape Breton in 1745 and 1758 will be found in "A Review of the Reign of George the Second in which a new Light is thrown on the Transactions, and the effects of Ministerial Influence are traced and laid open" (London, 1762, pp. 259). The review is impartial though justly severe on the men that administered England's affairs until the elder Pitt triumphed over the King's prejudices and the schemes of his political enemies. The name of the author is not given, but he is a fearless and well informed critic. He tells us what all writers admit—Tory or Whig—that "the restitution of Louisbourg (in 1748) was loudly complained against by almost every individual." The references to Louisbourg are pp. 82, 101, 102, 215, 216.

In the first volume of the "Canadian Archives" (pp. 18, 46) there is a synopsis of papers in the Public Record Office, London, ("America and West Indies," under subhead of "New England") which relate to the expeditions of 1745 and 1758 against Cape Breton. Among these are letters from Shirley to Newcastle giving accounts of the expedition against Louisbourg and of its surrender in 1745, and giving proposals (in 1746) for the abandonment of the fortress, filling up the harbour, and the establishment of a fort and town at St. Anne's. In the same documents there is correspondence from Admiral Saunders, General Wolfe, and Governor Whitmore, setting forth the proceedings of the fleet of Louisbourg before the attack on Quebec. The "Massachusetts Archives" have muster-rolls of campaigns of 1758. "Nar. and Crit. His.," v. 165.

The original authorities relative to the abortive expedition of Loudon and Holbourne against Louisbourg in the summer of 1757 are given by Parkman, "Montcalm and Wolfe" (i. 472, *n.*), viz.: Despatches of Loudon (August, 1757); Knox (who was with the expedition), "Historical Journals of the Campaigns of North America" (London, 1769, 6-28; "Review of Mr. Pitt's Administration" (London, 1763); "The Conduct of a Noble Commander in America Impartially Reviewed" (London, 1758); Beatson, "Naval and Military Memoirs" (ii. 49-59); "Answer to the Letter to two Great Men" (London, ii. 1760); Entinck (ii. 168, 169); Holbourne to Loudon (4th Aug., 1757); Holbourne to Pitt (29th Sept., 1757); *ibid* (30th Sept., 1757); Holbourne to Pownall (2nd Nov., 1757); Mante (86, 97) "Rélation du Désastre arrivé à la Flotte Anglaise commandée par l'Amiral Holbourne;" Chevalier Johnstone, "Campaign of Louisbourg;" 'London Magazine' (1757, p. 514); 'Gentleman's Magazine' (1757, pp. 463, 476)' 1758, pp. 168-173); 'Gazette de France' (621), To these original sources may be added the following brief accounts and references: "History of Great Britain to the Conclusion of the Peace of Amiens" (London, 1806, ii. 371-372); Walpole, "George II" (ii. 231); Mahon, "History of England" (xiv. 168); Smollett, "History of England" (cxxvii); Warburton, "Conquest of Canada" (ii. 113-119); Haliburton, "History of Nova Scotia" (i. 200-202); Murdoch, *ibid* (ii. 328, 329); Garneau, "Histoire du Canada" (ii. 266, 267); Brown, "History of Cape Breton" (285-290); Kingsford, "History of Canada" (iv. 31-37); Parkman, "Montcalm and Wolfe" (i. 469-472). M. Faucher de St.-Maurice, in "De Tribord à Babord" (Montreal, 1877) prints among the "Pièces Justificatives" (pp. 431-434) the semi-official French account of Holbourne's disaster off Louisbourg, Sept. 24, 1757.

XI. Maps and Illustrations of Cape Breton and Louisbourg, Portraits of Wolfe, etc.

The most accurate early maps of Cape Breton and Louisbourg are those by Nicholas Bellin, an able French engineer (author of "Le Neptune françois" and other cartographical works), under date of 1744. They are reproduced in Charlevoix's "History of New France." The "Nar. and Crit. Hist. of Am." (v. 440) has a copy on a reduced scale of his Cape Breton map. Richard Gridley, who did such good work at Louisbourg in 1745, has left a plan of the city and fortifications of the fortress, which appears in the "History of the French Dominions in America," by Jefferys, London, 1760, and in his "General Topography of North America and the West Indies," London, 1768, (No. 25). His plan has been largely copied in works relating to Louisbourg, the "Nar. and Crit. Hist. of Am." (v. 443-4) among others. Jefferys, in the first work, has also an elaborate map affording an excellent idea of the siege of 1758, as well as of the natural features of the port and its defences. The "Nar. and Crit. Hist. of Am." (v. 464, 470) reproduces part of Jefferys' map of 1758, as well as Brown's plan of the siege given in his "History of

Cape Breton." It also gives a part of the plate, "plan of the attack," (v. 471), which is in Mante's "History of the Late War." Jefferys' plans incorrectly call "Green" also "Goat Island," whereas the latter name was always given to the rocky islet on which the battery defending the harbour was built. Good views of the town and fortress are not in existence. Dr. Winsor gives three illustrations in the "Narrative and Critical History" (v. 447, 466) one of them from a painting in the possession of Mrs. Anna H. C. Howard, of Brooklyn, N.Y., which came to her by descent from Sir W. Pepperrell, and the two others from the coast views that accompany DesBarres' hydrographic surveys. These views were published in 1779, and an excellent copy of the whole work is in the Ottawa parliamentary library. I give a sketch of one of these drawings. The view is supposed to be from the northeast: a ship is coming through the entrance, and the lighthouse battery is on the right. It appears largely imaginary, as the fortress was not in existence when it was printed, in 1779. It is curious that no elaborate French views are in existence, so far as known. None certainly in Canada.

Nicholas Bellin's plans of Louisbourg and Quebec were frequently reproduced in England, Holland and Germany in the middle of last century. For instance, I have before me a sheet, 24 x 22 in., with the heading: Vorstellung einiger Gegenden und Plaetze in Nord America unter Franzoesisch und Englische Jurisdiction gehoerig zu finden bey den Homaennischen Erben in Nurnberg, A° 1756. It contains (1) "Plan du Port et Ville de Louisbourg dans l'Isle Royale; (2) plan de la Ville de Quebec." Both are the plans of Bellin given in Charlevoix. The third is in English: "Plan of the town of Halifax in Nova Scotia," and is coloured like the other two. It is a reproduction of a "Plan des havens von Chebuctou und der stadt Halifax (Hamburgh, 1751). The maps being pirated the author's name is not given in any case.

The following is a summary of maps, plans and views, in addition to those mentioned above.

1.—Plan spécial de Louisbourg, N. Visscher, Amsterdam.

2.—Plan des fortifications des Louisbourg, H. de Leth, Amsterdam, 1750.

3.—Le Petit Atlas Maritime, Nos. 23, 24, N. Bellin, 1764.

4.—A map "levé en 1756," after a plan of Louisbourg, preserved in the Dépôt des Cartes de la Marine in Paris.

5.—Same, in 1779, in the "Neptune Americo-Septentrional, publié par ordre du roi."

6.—In the same, under date of 1758, "levé par le chev. de la Rigaudière," with a view, of which there is a copy in the Mass. Archives: Docs. Collected in France, Atlas ii. 5. A similar plan and view by the same person was published at Paris in 1755, "chez Le Rouge, géographe."

7.—In this same (composite) atlas, (ii. nos. 44, 45) are maps of the town and harbour and a large plan of the fortifications, marked "Tome 1, No. 23.

8.—Four sheets on "The Southeast coast of Cape Breton Island, surveyed by Samuel Holland," published by DesBarres, in 1781.

9.—Map by Kitchen, London Magazine, 1747.

10.—Plan of the City and Harbour of Louisbourg, showing the landing place of the British in 1745 and 1758 and their encampment in 1758, in Jefferys' "French Dominions" and in his "General Topography."

11.—A set of plans and forts in America, reduced from actual surveys, London, 1763 or 1765. See "Nar. and Crit. Hist. of Am." on the question of date, v. 444, *n*.

12.—Sketch of Island battery. Curwen's "Journal," edited by Ward, Boston, 4th ed., 1864; reproduced in "Nar. and Crit. Hist. of Am.," v. 448.

13.—Plans of the town and fortifications (1745) by Durell and Bastide; of town and harbour (1755) by W.

Green; views by Bastide (1749), Admiral Knowles (1756), Ince (1758), engraved by Carnot (1762) and Thomas Wright (1766). All in the British Museum.

14.—A view of the landing of the N. E. forces in the expedition against Cape Breton (1745), published by Jefferys. Dr. John C. Warren of Boston has a copy of this print.

15.—Plan of Louisbourg, by Geo. Follings of Boston, gunner; in possession of Dr. A. H. Nichols of Boston.

16.—View of the town, in Cassell's "United States," i. 528. See Jefferys' copperplate engraving.

17.—Plans of the siege and fortifications in 1758, in Jefferys' "French Dominions," 1760.

18.—Plans in Mante's "History of the War."

19.—Map of siege of 1758 in "Abraham's Almanac," Philadelphia and Boston, 1759.

The reader will also find it profitable to consult the following work, although it contains no account of the condition of the island, but is of a scientific character, as its title shows, and is valuable for its revised maps:

"Voyage fait par ordre du Roi, en 1750 et 1751, dans l'Amérique Septentrionale, pour rectifier les Cartes des Cotes de l'Acadie, de l'Isle Royale, et de l'Isle de Terre-Neuve, et pour en fixer les principaux points par des observations astronomiques. Par M. le Marquis de Chabert. 4to. À Paris, 1753." It has only maps of Ile Madame, Strait of Fronsac and the southeast coast of the island from Morienne (Cow Bay) to Gabarus, besides a reduced chart of the coasts of Acadie and Ile Royale.

Later French plans and maps of important places in Cape Breton are the following:

"Carte réduite de l'Ile Royale assujettie aux observations astronomiques et nautiques, etc., faites par M. le Marquis de Chabert. Dressée au dépôt général des cartes de la marine, par ordre de M. de Sartine, 1783. Plans particuliers dependans de l'Ile Royale."

"Détroit de Canseau ou de Fronsac entre la Nouvelle Ecosse et l'Isle du Cap Breton, levé par les vaisseaux du roi d'Angleterre en 1761. A Londres, en 1775; a Paris, chez Le Rouge, 1778."

"Plan du Port Dauphin, de la rade de Ste. Anne, de l'entrée de Labrador et de la Baie de Niganiche. Dressé au dépôt général des cartes de la marine, par ordre de M. de Sartine. 1778."

"Plan de la Baie de Nérichac à la côte sud de l'Ile Madame. Dressé au dépôt général des cartes et plans de la marine, par ordre de M. de Sartine. 1779."

"Plan du Port Toulouse à la côte du Sud de l'Ile Royale. Dressé au dépôt général des cartes et plans de la marine, par ordre de M. de Sartine. 1779."

"The Atlantic Neptune," published for the use of the Royal Navy of Great Britain, by Colonel DesBarres, governor of Cape Breton, London, 1777, 2 vols., atlas fol.:

Vol. i, "Sea Coast of Nova Scotia."

Vol. ii, "Charts of the Coasts and Harbours in the Gulf and River of St. Lawrence, from surveys taken by Major Holland, surveyor-general of the northern coast." It contains interesting coast views of ports and towns of the province, contributed by British engineers.

Among the maps and views in this valuable collection are the following:

View of Louisbourg harbour.
Chart of northeast coast of Cape Breton, from St. Ann's bay to Cape Morien (Cow bay).
St. Ann's bay, Seymour cove and Indian bay.
Southeast coast of Cape Breton.
Harbour of Louisbourg.
Port Hood.
View of Port Hood.
Cape Breton and Sable island.
Lenox passage, Bay of Rocks to St. Peter's island.
Gut of Canso, part of Cape Breton and the Richmond isles.
Gut of Canso, Bay of Rocks to St. Peter's island.
Views of Port Hood and Plaister Cove.

In addition to the maps and illustrations noted in the foregoing paragraphs the "Nar. and Crit. Hist. of Am." (vol. v) gives the following: Pepperrell arms (see also "Mag. of Am. Hist.," Nov., 1878), Autographs of Auchmuty, Boscawen, Pepperrell, Rous, Tyng, Vaughan and Warren, portraits of Boscawen and Wolfe, Entinck ("Hist. of the Late War," vols. ii, iii, iv) has portraits of Pitt, Amherst, Boscawen and Wolfe. Wright's "Life of Wolfe" has for frontispiece a photographic portrait of the general, from an original picture in the possession of Admiral Warde, K.H., who inherited it from his granduncle, General Warde, Wolfe's dearest friend. It was painted by an artist, unknown to fame, soon after Wolfe entered the army, and shows a boyish full face, not remarkable for expression. Wright knew of only two undoubted portraits of the hero of Quebec: the one just mentioned, and the

other painted by Highmore, now in the National portrait gallery. West's great painting of Wolfe as a boy studying a map of the battle of Blenheim was made in 1775, but it is partly imaginary in some respects. See Wright, 604, 605. Knox's "Journal" has an engraved portrait reproduced in "Nar. and Crit. Hist. of Am.," v. 541. Hart, "Fall of New France," has portraits of Boscawen, Wolfe and Amherst. See *infra*, last paragraph of this section. Parkman, in "Montcalm and Wolfe," reproduced the Warde portrait. Warburton, in "Conquest of Canada," has a frontispiece representing him standing with his right arm extended and giving only his profile—a very common picture in works relating to his times. It is described as "from a scarce contemporary print." There is an inferior portrait of Wolfe in the Parliamentary library, in profile, engraved from Mr. Isaac Gorset's model by J. Miller. I know of no portraits in Canada of Duchambon, Drucour, or Vanquelain, or other persons whose names are mentioned in connection with Louisbourg.

In "Nooks and Corners of the New England Coast" (New York, 1875), by Samuel Adam Drake, already mentioned as the author of a little work on the taking of Louisbourg in 1745, there is some interesting information respecting York and Kittery Point, famous as the home of Pastor Moody and Sir William Pepperrell. Illustrations are added of Kittery Point, of Sir William's old mansion and of a portrait of the latter, which is hanging in the large hall of the Essex institute, at Salem, and is asserted by Drake to have been painted in 1751 by Smibert when the baronet was in London. It "represents him in scarlet coat, waistcoat and breeches, a smooth shaven face and powdered periwig; the waistcoat richly gold embroidered, as was then the fashion, was worn long, descending almost to the knee, and formed the most conspicuous article of dress. In one hand Sir William grasps a truncheon, and in the back-ground the painter has depicted the siege of Louisbourg." The "Memorial History of Boston" (ii. 114) contains an engraving of the same picture, of which, however, according to the editor of the "Nar. and Crit. Hist. of Am," (v. 435, *n*), the artist is unknown. The work just cited gives an engraving after a painting owned by Mrs. Anna H. C. Howard, of Brooklyn, N.Y., which descended to her from Pepperrell, and was painted by Smibert. It is also engraved in Parson's "Pepperrell," Drake's "Boston," and the "N. E. Hist." and "General Reg.," Jan., 1866, where Dr. Parsons gives a genealogy of the Pepperrell family. He gives a list of Pepperrell's descendants in his "Life," pp. 335-341. Also a view of the Pepperrell mansion at Kittery, p. 329. See Lamb's "Homes of America, 1879," "Magazine of Am. Hist.," ii. 673; 'Appleton's Journal,' xi. 65.

Dr. Francis Parkman, in his papers in the "Atlantic Monthly" (March, 1891) gives a graphic description of the present appearance of the picturesque locality in Maine made famous by its associations with Sir William. Kittery Point bears the name of a little village in England, and as it was founded in 1623 justly claims the honour of being the first and oldest town in Maine. See chapters iv and x of "Nooks and Corners" (Drake).

"The Fall of New France, 1755-1760," by Gerald E. Hart, with portraits and views in artotype (Montreal, Toronto and New York, 1888), devotes six pages to the victory of 1758. So short an account gives little or no opportunity for doing full justice to the momentous event, which occurred so opportunely for England. Mr. Hart's book is handsomely printed and is chiefly interesting for the excellent portraits and illustrations it gives of men and places famous during the memorable times of which he writes. The portrait of Amherst is a mezzotint by James Watson, after a painting by Sir Joshua Reynolds, probably in 1763. That of Boscawen, from an engraving by Ravenet from the original painting. That of Wolfe is the very rare mezzotint by C. Spooner, after a sketch by Capt. Harvey Smith, his aide-de-camp. Entinck has similar portraits of Boscawen and Wolfe. See Hart, 166, for references to Wolfe's various portraits.

XII. Louisbourg Medals.

In 'The Transactions of the Quebec Literary and Historical Society' for 1872-3, No. III, appears an interesting paper by Mr. Alfred Sandham on "The Historical Medals of Canada." He tells us that in 1720 the French government ordered a bronze medal to be struck to commemorate the foundation of the fortress of Louisbourg. Seven medals, according to Sandham, were struck by the English government in commemoration of the taking of Louisbourg in 1758. Wright ("Life of Wolfe," 605-606) refers only to two of the medals commemorative of the siege of Louisbourg.

A pamphlet on "The Louisbourg Medals," by Mr. R. W. McLachlan, an enthusiastic antiquarian of Montreal, gives us more complete information on the same subject. His list comprises fourteen medals, or six more than those enumerated by Sandham. Four of them appear in the same lists, but Mr. McLachlan doubts the existence of two of Sandham's. Mr. McLachlan gives us the names of the makers of the medals in most cases, with an estimate of the value of each. I give illustrations of two of the medals in his valuable collection, in another part of this paper. (See *supra*, secs. II, VII.) Mr. McLachlan gives the names of Kirk, Pingo and Pinchbeck as among the principal makers.

1. Obv.: Ludovicus XV. D. G. Fr. et Nav. Rex. Youthful bust of the king, with long hair. Under the bust, which faces to right, Du Vivier.

Rev.: LUDOVICOBURGUM FUNDATUM ET MUNITUM. EX: MDCCXX. A view of the town and harbour of Louisbourg. Bronze; size, 41 millimetres.

2. Obv.: LUDOVICUS XV. REX CHRISTIANISSIMUS. Laureated older head of the king to the right.

Rev.: Same as last. Bronze; size, 41 m.

3. Obv.: PAX UBIQUE VICTRIX EX: GALLORUM ET BRITANNORUM (CONCORDIA) MDCCLXIII. Peace to the right, standing with an olive branch in her extended right hand and a caduceus in her left. At her feet, seated on a battering-ram, is War as a nude male figure, bound; surrounding them are flags, battle-axes and other implements of ancient warfare. Bronze; size, 41 m.

Rev.: Same as No. 1.

4. Obv.: GEORGIUS II. REX. Laureated bust of the king to the left.

Rev.: SENIGAL MAI. 2. MARSH MASON. ST. MALOS IUN. 16. MARLBORO. CHERBOURG AUG. 16. HOWE. LOUISBOURG. IUL. 27. BOSCAWEN. AMHERST. FRONT. AUG. 27. BRADSTREET. DUQUESNE NOV. 24. FORBES. GOREE. DEC. 29. KEPPEL. Britannia in a chariot drawn by a lion over ground strewn with fleurs-de-lis, by her right walks Justice, and on her left Liberty. Above is a scroll inscribed FOEDUSINVICTUM, and underneath the date MDCCLVIII. Brass; size, 43 m.

5. Obv.: GUADALOUPE BARING MOORE. MAY 1. NIAGARA JOHNSON IULY. 25. QUEBEC WOLFE MONCK$_{n}$ TOWNS$_{d}$ SEP. 13 and 18. CROWN POINT AMHERST AUG. 4. LAGOS BOSCAWEN AUG. 19. HAWKE QUEBERON NOV. 20. MINDEN FERDINAND AUG. 1. A shield, with a fleur-de-lis reversed, supports a lion to the left and a unicorn to the right. Garter inscribed PERFIDIA EVERSA, and ribbons with W. PITT. AUSP. GEO. II PR. MI. Underneath is the date MDCCLIX. Brass; size, 43 m.

Rev.: Same as last.

6. Obv.: O. FAIR BRITANNIA HAIL. A nude female bust to the left. From behind the bust appears the top of a trident.

Rev.: LOVISBOVRG TAKEN. MDCCLVIII. Victory to the right standing on the prow of an ancient war vessel. In her right hand she holds a wreath, and in her left hand a palm branch. Copper; size, 39 m.

7. Obv.. O· FAIR· BRITANNIA· HAIL. A nude female bust to the left, with a liberty cap before and a trident behind. Underneath is I. KIRK.

Rev.: LOVISBUVRG· TAKEN· MDCCLVIII. EX: I· KIRK· F. Victory to the right running; in her hand is a large fish, with a number of smaller fishes above it, and in her left a palm branch on a pole, with a shield bearing a fleur-de-lis and an ancient cuirass. Bronze; size, 41 m.

8. Obv.: A globe inscribed CANADA AMERICA, resting on a nude female figure which is prostrate on a rock, and is pointing to an inverted fleur-de-lis. On the left of the globe is a soldier, with musket and bayonet, pointing to Canada on the globe, and to the left is a sailor waving his hat. Over the globe is a scroll inscribed PARITER· IN· BELLA, behind it the Union Jack, and above Fame, with a wreath in her left hand, blowing a trumpet. In the distance are five small boats and a high rock. To the left is T· PINGO· F. Bronze; size, 44 m.

Rev.: LOVISBOVRG· TAKEN· MDCCLVIII. View of Louisbourg harbour. In the foreground is a battery firing on two war vessels, one of which is burning. To the right is the town, and in the distance are six vessels. On the left is Lighthouse Point.

9. Obv.: ADMI· BOSCAWEN· TOOK· CAPE· BRETON. Half length figure of Boscawen in mailed armour to the right.

Rev.: LOVISBOVRG· EX: IUL· 26· 1758. A rude view, intended for but altogether unlike the town and harbour of Louisbourg. To the right is a hill surmounted by a tower. A ball from a mortar is about to strike the tower, and the flag seems to be about to drop or is being lowered. The town is clustered at the foot of the hill. To the left is a small tower with six men around it. In the harbour in front of the town are five vessels, three small and two large ones. Brass, or better, Pinchbeck; size, 40 m.

10. Obv.: Same as last.

Rev.: LOVISBOVRG EX: IUL 26 1758. Similar view, but the hill is larger and the mortar and ball are wanting; there are only two men beside the tower; to the right two small and two larger vessels. Copper or dark mixed metal; size, 41 m.

11. Obv.: ADML. BOSCAWEN TOOK CAPE BRETON. Three-quarters figure of Boscawen to the right in naval uniform; in his right hand he holds a baton.

Rev.: LOVISBOVRG EX: IUL. 26, 1758. Similar view, but the tower on the hill is to the left. There are five small vessels and two larger ones. Brass; size, 37 m.

12. Obv.: Similar to the last, but there are fewer buttons on the coat and the baton is shorter.

Rev.: LOUISBOURG HARBOUR. EX: IUL 26 1758. Similar view. There are three hills with the tower on the one to the left. The other hills are each surmounted with a small building. In the harbour are four small vessels and one large one. Brass; size, 37 m.

13. Obv.: Similar to No. 11.

Rev.: LOVISBOVRG EX. IUL. 26. 1758. Similar view. Tower on rising ground to the left, other buildings scattered over the field. There are no men standing beside the smaller tower to the right. In the harbour there are five small vessels and two large ones. Brass; size, 23 m.

14. Obv.: To BRAVE ADML. BOSCAWEN. Figure of Boscawen as in No. 9.

Rev.: I SURRENDER PRISONER EX: 1758. Drucour to the right on one knee, handing his sword to Boscawen. Copper; size, 26 m.

The "Annual Register" (London, 1762) gives a description of a magnificent building of the Ionic order which the Earl Temple erected at Stowe and dedicated to "Concordiae et Victoriae." Among the fourteen medallions on the wall, representing England's victories on sea and land in the four quarters of the world, was one representing the taking of Louisbourg in 1758. See "Conquest of Canada" (Warburton, ii. 499).

XIII. THE MICMAC INDIANS AND THEIR LANGUAGE.

It appears well established that "Acadie" is a French version of a Micmac affix, ākăde, signifying a place or land or district, or other cognate term, invariably used in connection with another word to show some natural characteristic of the locality. We find the first mention of the name in the letters-patent of 1603, granted to Sieur de Mons, who was given the right to settle and inhabit "les terres, costes et païs de Cadie et aultres circonvoisins en l'estendue du 40e degré jusqu'au 46e" (see "Quebec Documents," i. 46). Forming part of a compound word ākăde sometimes might be mistaken for kadie, as it may be easily understood by reference to the following interesting list taken from Dr. Rand's Micmac dictionary:

1. Wŏbe-ākăde.....Swan-land (now Broad River Lake in N.S.).
2. Apcheechkŭmoochwa-ākăde.....Duck-place (Canard River, N.S.).
3. Kitpooa-ākăde.....Cape Shubenacadie (meaning not given).
4. Booslooā-ākăde.....Cape Traverse ("bouselooa" meaning to travel by water).
5. Ootkoodăkŭna-kăde.....Grave-yard.
6. Kŭlŭmoočchwŏpskwā-ākăde.....Coal-mine.
7. Wikpeā-'kăde.....Elm-grove.
8. Nŭmāchwā-'kăde.....Fish-place.
9. Utkogŭn-ākăde.....Indian harbour (meaning not given).
10. 'Mskegooa-'kăde.....Grass-field.
11. Sooleāw-ākăde.....Silver-mine.
12. Kŭsăwogwā-ākăde.....Iron-mine.
13. Soolā-'kăde.....Mira river (meaning not given).
14. Wĕnjoosoon-ākăde.....Apple-place or orchard.
15. Madooesw-ākăde.....Porcupine-place.
16. Bāslooā-ākăde.....St. Peter's island (meaning not given).
17. Segubun-ākăde.....Ground-nut place (Shubenacadie).

A note by the editor of Dr. Kohl's "Documentary History of Maine, in the collections of the Maine Historical Society (i. 234, 235, *n*), on the authority of Porter C. Bliss, a thorough student of the Indian dialects, gives the same meaning to Acadie, whose "origin is ahki, land or place, with da, a particle of admiration added; translated by Rale, voilà, there, implying abundance." Rev. Dr. Patterson, in his "History of the County of Pictou, N.S." (Montreal, etc., 1877) tells us that "every prominent object, whether hill or river, streamlet or lake, headland or island, had its appropriate designation in their [Micmacs] language," and he gives (pp. 31, 32) a few of the Micmac names with the meanings, obviously furnished by Dr. Rand, from whom I have quoted the foregoing list. See also Gesner, "Resources of Nova Scotia" (Halifax, 1849), pp. 2, 31.

Reference has been made more than once in these notes to "The Dictionary of the Language of the Micmac Indians, who reside in Nova Scotia, New Brunswick, P. E. Island, Cape Breton and Newfoundland," by the Rev. Silas Tertius Rand, D.D. (Halifax, 1888). The compiler of this valuable dictionary was for more than fifty years a missionary among the Micmac Indians of the maritime provinces of Canada. He translated and published the whole of the new and portions of the Old Testament in the Micmac language, and arranged as many as 40,000 words in alphabetical order. He also constructed a Micmac grammar and reader. Leland in his "Algonquin Legends" gives a number of Micmac tales contributed by Dr. Rand. The Parliament of Canada made an appropriation to aid the publication of the English-Micmac portion of his laborious studies, and the other part—the Micmac-English—is also in their hands, and it is hoped will soon be published. His investigations have been of great value to the philologist and antiquarian. Dr. Rand was a fine scholar and familar with Hebrew,

Syriac and other tongues, modern and ancient. He translated a number of hymns into Latin—one of them, the Rock of Ages, is especially meritorious. He was a native of Nova Scotia—of the beautiful country first inhabited by the Acadians, and died at Hantsport, the entrance of the land of Evangeline, in 1889.

On the subject of the early history of the Micmac Indians consult L'Escarbot, "La Conversion des Sauvages qui ont été baptistes dans la Nouvelle France cette année, 1610, avec un recit du Voyage du Sieur de Poutrincourt" (see "Nar. and Crit. Hist. of America," iv. 150; Sabin, Harrisse, No. 21); "Champlain" (Laverdière's ed.), 115, 184, 728, 743; Williamson, "History of Maine," p. 478; Denys, "Amérique Septentrionale," vol. ii; Le Clercq, "Nouvelle Relation de la Gaspésie" (Paris, 1691); "Relations des Jesuites" (Quebec, 1858), i. 2-31 (index is inaccurate under head of Souriquois, year 1666 being given for 1611, Biard's Relation); *ib.* 42-44 (Cape Breton especially referred to), iii. 7-10; Pichon "Memoirs," Letters VII-X; Hannay, "History of Acadia," 13, 43-58, 90, etc. Murdoch and Haliburton in their histories of Nova Scotia, and Garneau in his "History of Canada," have frequent references to their habits and condition during the French *régime*. Brown, "History of Cape Breton," Letter X, reviews their state very fully, and has besides numerous references throughout the work. Diéreville, "Relation des Voyage du Port Royal, de l'Acadie, ou de la Nouvelle-France, etc." (in 1708), in prose and verse, describes the manners, superstitions and pursuits of the Indians of Nova Scotia.

The condition of the Indians in 1757-58 is described by a French missionary in a pamphlet published in London in 1758 as "An Account of the Customs and Manners of the Micmacs and Maricheets, savage nations now dependent on the Government of Cape Breton" (Field, Ind. Bibliog., No. 1062; Quaritch, No. 29, 984; "Nar. and Crit. Hist. of Am.," v. 452; J. G. Shea, in 'Hist. Mag.,' v. 290; 'Nor. Am. Rev.,' cxii, Jan., 1871.) The first Micmac grammar was that by the Abbé Maillard, a French missionary, for many years at Louisbourg and at St. Peter's, and in eastern Nova Scotia until 1759, when he was induced to go to Halifax and use his influence to quiet the Micmacs. He was in the pay of the British government from that time, and died in 1768. (See Akins, "Nova Scotia Documents," 184, *n.*) His grammar was arranged by J. M. Bellenger and published in New York in 1864 (Cramoisy), but only a hundred copies are reported to have been printed (4to., 101 pp.; Dufossé's Cat., No. 49,203). In the "Nar. and Crit. Hist. of America" (iv. 268, 269) there is a brief summary of the work done in the Micmac mission from 1634-1768. In the 'Trans. Roy. Soc. of Lit.,' xiv. 1887, C. Godfrey Leland has a paper on "The Mythology, Legends and Folk-lore of the Algonquins," which subsequently appeared in a separate form. His interesting work on "The Algonquin Legends of New England; or, Myths and Folk-lore of the Micmac, Passamaquoddy and Penobscot Tribes," was published in 1884 at Boston. He can trace in the legends and myths of the Indians evidence of the old Norse voyages. The Micmacs are even believed by Professor Storm to be the Skraellings of the Norsemen. (See 'Scottish Review' for October, 1891, p. 361; Sir Dan. Wilson, in 'Trans. Roy. Soc. of Can.,' viii. sec. 2, art. 3.)

XIV. The Acadian French in Cape Breton.

"La France aux Colonies: Études sur le developpement de la Race française hors de l'Europe, par E. Rameau" (Paris, 1859), contains an interesting account of the Acadian French population in the island of Cape Breton (pp. 3, 71-79, 147-149), with the view of showing its development since the days of the French rule. From this work we obtain the following estimates of the French population of Cape Breton, at different dates after the taking of Louisbourg and the removal of its garrison and inhabitants to France:

In 1758	1,000, two-thirds Acadian, settled on the coast and the Labrador (Bras d'Or). This is obviously an over-estimate.
In 1827	6,000
1838	9,500

1859—Richmond County.

Ardoise	1,200
Bourgeois	700
Arichat and Descousse	5,700
St. Pierre, Rivière des Habitants, etc.	1,500
	9,100

Cape Breton County.

Little Bras d'Or	600

Inverness County.

Marguérite (Margaree), Cheticamp, etc.	4,000
Total in 1859	13,700

By the census of 1881 the French population of Cape Breton was given at 12,426 souls, distributed as follows:

INVERNESS.

Marguérite (Margaree) Harbour	1,039
Cheticamp	2,350
Young's Bridge and other places scattered at the North	246
	3,635

CAPE BRETON.

Sydney, Ball's Creek, Lingan, Manadieu, Boularderie, Catalogne and East Bay (Louisbourg claimed only nine persons of French descent), in all	1,336

RICHMOND.

Petit Degrat	1,626
D'Escousse	1,261
L'Ardoise	1,501
Arichat and West Arichat	1,844
River Bourgeois	688
River Inhabitants (Rivière des Habitants)	244
St. Peter's	180
Other places	4
	7,348

VICTORIA.

Inganiche	107
Bay North and Bay of St. Lawrence	4

It seems as if Mr. Rameau's estimates were considerably beyond the mark. For instance, the figures he gives for 1859—13,700—are contradicted by the census of 1861, which distributes the Acadian population as follows:

Richmond	5,733
Inverness	2,104
Cape Breton	362
	8,199

No statistics are given for Victoria county, but they would not probably add more than 100 to the whole number. It is impossible to believe that there could have been such a decrease in two years as a comparison of the figures for 1859 and 1861 would indicate. The French Acadians of Cape Breton then only emigrated year by year in small numbers. Probably the census of 1861 was not very accurately taken. Indeed the report itself admits that the enumerators found many persons unwilling to give information, "professing to believe that the object of taking the census was for the purpose of imposing taxation." The Acadians were probably among this number. A people who are in a minority, and form a separate isolated class in a community, are likely to look with suspicion on an enumeration of their numbers and property. Few of them in those days were well informed and educated. But making every allowance for the imperfections of the census returns they do not fully explain the large discrepancies between 13,700 and 8,299. Indeed, making an allowance for a natural increase of 2 per cent. a year based on the census, which showed an average increase of 20 per cent. in ten years over the whole province—and, in fact, in Richmond it was 22 per cent.—we have a still greater difference between the two sets of figures. Consequently we have no doubt that Mr. Rameau has greatly exaggerated the numbers, and contributed to create the wrong impression that the race in Cape Breton is decreasing in a large proportion from emigration and other causes. A much higher authority in such matters, Mr. Taché, long connected with the department of agriculture of Canada as deputy minister, and a *littérateur* of some note, has given us some interesting statistics relating to the Acadian French of Cape Breton in the introduction to the census reports for 1871. He gives a table from which we learn that there were in Cape Breton:

In 1749	1,000	Acadian French.
1755	3,000	before and after the expulsion of the Acadians from Nova Scotia.
1756	2,500	
1758	700	after taking of Louisbourg.
1763	780	
1765	800	
1771	920	
1871	10,864	

Accordingly since 1758 the Acadians have increased from 700 to probably 15,000 souls at the present time, supposing the rate of increase to have been the same during the decade ending in 1891, as it was in the decades of 1861-1871, and 1871-1881. For many years there has been a small migration of French Acadians from Cape Breton, especially among young women who have gone to the United States for employment, but the rate, I think, will be found small compared with the emigration of the English-speaking peoples from the island. For other references to the French population of Cape Breton see Pichon's Mémoires; Haliburton's History; Taché, "Projet

d'union fédérale pour les provinces de l'Amérique Anglaise" (1858); "Census of Canada for 1871 and 1881" (Government of Canada), Ottawa; Fontaine's edition of "De Diéreville en Acadie" (Quebec, 1885). In an elaborate paper by the Abbé Casgrain on "La Dispersion des Acadiens," ('Trans. Roy. Soc. Can.,' v, sec. 1) the reader will find numerous references to the Acadians of Cheticamp and other parts of Cape Breton. A paper in the 'Collections of the Nova Scotia Historical Society' for 1889-91 (Halifax, 1891), by Dr. Allison, superintendent of education (see pp. 55-59), estimates the number of Acadian French in Cape Breton at only 271 in 1767—too low an estimate, not supported by the information I have gathered from all sources. Dr. Taché's estimate of all the French in the island in 1765 at 800 is nearly correct. In 1766 a considerable number came into the island, as I have shown in the text, sec. X.

XV.—General Bibliographical Notes.

Sir Hovenden Walker printed in London a vindication against charges of incompetency and peculation that were made—and properly too, we can believe, as to the first count—against himself. His account of his visit to the harbour of Sydney, mentioned in the text of this monograph, is necessarily brief, and evidently written to show that he had asserted England's claim to Eastern America. This attempted vindication had for its title: "A Journal: or full account of the late expedition to Canada, with an appendix containing commissions, orders, instructions, letters, memorials, courts-martial, councils of war, etc., relating thereto

"Rebus angustis animosus atque
Fortis appare: Sapienter idem
Contrahes vento nimium secundo
Turgida Vela

—*Hor. Lib.* 2, *Ode* 10,

London: printed for D. Browne at the Black Swan, etc., 1720." See an excellent resumé of the journal in "De Tribord à Babord; Trois Croisières dans le Golfe Saint Laurent," by Faucher de St. Maurice (Montreal, 1877).

The reader will be interested in the references to Cape Breton in "A concise account of North America, containing a description of the several British colonies on that continent, including the islands of Newfoundland and Cape Breton, to which is subjoined an account of the several nations and tribes of Indians residing in those parts," (London, 1765, 271 pp., with a map). The author was Major Robert Rogers, a famous commander of the "Rangers" during the old French war. He describes his adventures in his well known 'Journals' (London, 1765; Dublin, 1769). He played a doubtful part in the war of independence, and finally raised the Queen's Rangers, who were very effective on the English side. See Parkman's "Montcalm and Wolfe."

"Mémoire historique sur la négotiation de la France et de l'Angleterre depuis le 26 Mars 1761, jusqu'au 20 Septembre de la même année avec les pièces justificatives," (Paris, 1761), shows efforts made by France to retain Cape Breton.

A curious and rare book is now before the writer: "A statement submitted by Lieut.-Colonel DesBarres for consideration, respecting his services from the year 1755, to the present time—in the capacity of an officer and engineer during the war of 1756—the utility of his surveys and publications of the coasts and harbours of North America, intituled, 'The Atlantic Neptune'—and his proceedings and conduct as lieutenant-governor and commander-in-chief of his Majesty's colony of Cape Breton." The book is in large folio, and contains 108 pages, but neither the date of publication nor the name of the printer appears on the title page. It contains a most minute recapitulation of DesBarres's claims against the English government. It is obvious from the facts and documents set forth that he was badly treated. The work gives some insight into the entire absence of interest in England in the affairs of so insignificant a colony as Cape Breton. The nature of the squabbles between the governor and the military at Sydney is set forth with elaborate detail. The governor, it is clear, acted for the best and deserved more consideration than he ever received from indifferent officials in London. The biographical sketch of Governor DesBarres in Appleton's "Cyclopædia of American Biography" (New York, 1887) states that "he wrote a work on Cape Breton, which was printed privately (London, 1804), but afterwards suppressed." I cannot verify the existence of any work by him on Cape Breton except the "statement" of his case under consideration, in which there is a great deal of valuable information respecting the settlement, the natural advantages and the condition of the island during his governorship. Brown (History, 388) makes use of this work in giving an account of his services and of his official career in Cape Breton. In 1805 he was appointed lieutenant-governor of Prince Edward Island, no doubt as an acknowledgment that he was deserving of better treatment than he had received for some years of his life, and he remained until 1813 in this position, which the historian of the island (Campbell, 61) says he filled with discretion, if not with the display of any signal ability. He died at Halifax in 1824 at the remarkable age of 102. He was father of the late Judge DesBarres, of the supreme court of Nova Scotia (See "Murdoch, ii. 441; iii. 523.)

Hon. W. Smith, who was formerly surgeon on the military establishment of Cape Breton (see *supra*, sec. VIII) and chief-justice in 1799, was author of "A Caveat against Emigration to America, with the state of the Island of Cape Breton, from the year 1784 to the present year; and suggestions for the benefit of the British Settlements in North America" (London, 1803, pp. 158, 8vo.) See Morgan's "Bibliotheca Canadensis."

In the second volume of "The British Dominions in North America, etc.," by Joseph Bouchette, surveyor-general of Lower Canada (London, 1832, 2 vols., pp. 72-92), there are two chapters giving a topographical and statistical account of the island, including a description and three sketches of the dangerous rocky island, ten miles northeast of Cape Breton, known as St. Paul's Island. Much of the information in these chapters is taken from Haliburton's and McGregor's accounts of the island. Bouchette's works in their day were of great value to Canada—indeed the most accurate and complete of their kind ever published in the Dominion. He was the English surveyor who, with the United States surveyor, John Johnson, erected a new monument in 1817, under the treaty of Ghent, at the source of the St. Croix river, which had been determined by commissioners in 1798, under the treaty of 1794. (See vol. i, pp. 13-14.)

Valuable references to the importance and natural advantages of Cape Breton will be found in "The Industrial Resources of Nova Scotia, etc.," by Abraham Gesner, surgeon, fellow of the Geological society, etc. (Halifax, 1849). Dr. Gesner was a scientific man of fair attainments. He visited Cape Breton in the flagship of the famous Earl of Dundonald, who took much interest in the scientific investigations of the author. The admiral was an uncle of the Dundonald who was surprised at a redoubt near the shore and killed by the French in a sortie during the siege of 1758; for Dr. Gesner is wrong in stating that "he fell in approaching the fortress along the line of the sea-wall." (See *supra*, sec. VII, and Brown, 310.) He devotes a number of pages (300-312) to a general description of the climate, scenery and resources of the island, as well as to the appearance of Louisbourg in 1849. Like all other persons who have visited and studied the island of Cape Breton, Dr. Gesner had a high opinion of its natural advantages. "A glance at the map," he says on p. 312, "would almost satisfy the inveterate sceptic that nowhere can there be found a position so favourable for maritime pursuits as that of Cape Breton. It was with this view that France expended her millions of livres in fortifying Louisbourg. Where are there to be found such harbours, mines, fisheries, facilities of inland transport and schools for seamen, and to these has been added a soil capable of yielding the ordinary bounties produced by husbandry."

Judge Marshall, who was the first judge appointed to the island after its annexation to Nova Scotia in 1820, left behind him a short monograph giving his personal reminiscences of the hardships and difficulties that attended a judicial circuit in those days, "when large portions of my journeys were performed in Indian canoes, in which I have sometimes passed the greater part or the whole of the night, occasionally paddling to lessen chilliness, and to afford the poor, tired squaw a partial relief." The old judge—he died in his 94th year—describes the lawless elements which existed during his time in this sparsely settled island. (See "The late Judge Marshall; or, the Record of an Earnest Life," by J. G. Bourinot, in 'Canadian Monthly,' 1880.)

The wreck of the Augusta, mentioned in sec. XI, is described in "Les Anciens Canadiens," by Philippe Aubert de Gaspé (Quebec, 1863, and Montreal, 1886), whose chief merit is that he has given us a faithful record of the times of which he writes and preserved memoirs of events which otherwise would have disappeared with those who had taken part in them. General Murray was responsible for sending the unfortunate people in the wretched old hulk, which went ashore in the fall of 1761, apparently from the description, on the northeastern coast of Cape Breton, a little south of Cape North. Only five or six passengers were saved; these succeeded at last in reaching the Acadian settlements, the names of which are not given. Among these was M. de la Corne de Saint-Luc, who published an account of the disaster at Montreal in 1778, from which M. de Gaspé corrected his own version, at first largely drawn from the memory of stories told him by members of his own family. See an excellent translation of the book by Prof. Roberts, the Canadian poet (New York, 1890); also LeMoine's "Maple Leaves," new series, 79, 115; Faucher de St. Maurice, "De Tribord à Babord," 186-189.

"A History of Nova Scotia, Cape Breton, the Sable Islands, New Brunswick, Prince Edward Island, the Bermudas, Newfoundland," by R. Montgomery Martin, F.S.S. (London, 1837), contains two chapters, of forty-five pages in all, describing the history, the geography, the physical features, the geology and the products of Cape Breton. The historical part, which is very imperfect, is made up of information furnished him by Judge Haliburton, the author of the history already mentioned. The description of the natural features and resources is interesting and correct for the time when written. Martin wrote other works of the same character on the provinces of old Canada, and, like his book on the maritime provinces, their chief value lies in the statistical statements. Works of the same class were J. McGregor's "British America, etc." (Edinburgh, 1832, 2 vols.), and Hugh Murray's "British America, etc." (Edinburgh, 1839, 3 vols.)

Hugh Gray, in a series of letters written from Canada during 1806-1808 (London, 1809; 2nd ed. 1814), dwells on the commercial importance of Cape Breton.

"Journal of Visitation in Nova Scotia and Cape Breton, and along the eastern shore of New Brunswick in the summer and autumn of 1843," by Rt. Rev. John Inglis, bishop of Nova Scotia (London, 1844). The author, who gives some interesting details of Cape Breton, was a son of the first bishop of the Church of England appointed in the British colonies in America (in 1787), and who had been previously rector of Trinity Church, New York.

In "Our Own Country, Canada, Scenic and Descriptive, being an account of the extent, resources, physical aspect, cities and chief towns of the provinces of Nova Scotia, etc.," by Rev. W. H. Withrow, D.D., F.R.S.C. (Toronto, 1889), we have a description of the scenery of Canseau, Ile Madame, Bras d'Or, Sydney, Louisbourg, with views of a fishing village, of Louisbourg, and of modern aspects of life and industry in the island.

"Baddeck and that Sort of Thing" (Boston, 1874) represents the humour of Charles Dudley Warner, to whom the pretty village on the Bras d'Or owes its present fame. The historian, like the tourist, will find the little volume a source of amusement in summer days, when he and all the world seek relief from the ordinary vocations of life, and have no desire to take books and things too much *au sérieux*.

"Picturesque Canada" (Toronto), edited by Very Reverend Principal Grant, and illustrated under the supervision of the Canadian artist, L. R. O'Brien, Pres. R.C.A., contains, towards the close of the second volume (pp. 841-852), a brief description of the island, its history, scenery and resources, and several illustrations of North Sydney, of Caledonian mines, of the ruins of Louisbourg, of the new town near the railway pier, and of Lake Catalogne. A sketch of the Tantramar marshes in Cumberland Co., N.S., however, is misplaced in a sketch of Cape Breton. The writer suggests a memorial on the site of Louisbourg to commemorate the achievements of 1745-1758.

In 1873 a committee of the House of Commons of Canada was appointed (see Jour., App. No. 5) to report on the shortest route for mails and passengers between America and Europe. Tables of distances are given between points in Europe and the ports of Louisbourg and of Shippegan on the eastern coast of New Brunswick—a place to which attention was being drawn at that time with a view of creating trade for the Intercolonial railroad. The committee were in favour of Louisbourg, which "has the great advantage of being reported to be open and accessible throughout the entire winter season; of being from sixty to one hundred miles nearer Europe than Shippegan, in the direct line of ocean travel between Europe and the northern ports of the United States, and of possessing large and valuable coal fields in its immediate vicinity where coaling could be effected at a lower rate than any place in Britain or America."

An illustration of the efforts of the people of the almost forgotten island, many years ago, to compete for a space of the great European traffic is a little pamphlet before me with the title: "European and American Railway Terminus—Sydney, Cape Breton, the nearest port in British North America to Europe," printed in 1851, on very common paper, at the office of the *Cape Breton News*, for many years the only paper published in the island. It represents the advantages of the noble port of Sydney as a railway terminus compared with Louisbourg and other places in Eastern America, but forty years have passed since the pamphlet was printed, and of the committee of twenty-five gentlemen appointed to draft a report only two have lived to see a railway in 1890 opened to Sydney. In fact, of the 125 persons who signed the requisition to call the public meeting from which the report in the pamphlet emanated only thirteen remain. The following are the names of the committee, with those living in italics: Hon. Mr. Justice Dodd, Hon. J. McKeagney, M.E.C., M.P.P., W. H. Munro, M.P.P., James McLeod, M.P.P.; C. E. Leonard, Custos; P. H. Clarke, agent for Lloyds; Richard Brown, agent for the Mining Association (the historian of Cape Breton); T. D. Archibald (afterwards Senator), J. Bourinot (afterwards Senator), *E. P. Archbold*, P. Moore, G. H. Gesner, Capt. Ouseley, H. Davenport, E. Sutherland, H. Munro, N. H. Martin, Wm. Gammell, Thomas Brown, D. N. McQueen, *A. F. Haliburton*, L. Robertson, John Ferguson, D. B. McNab and J. Robertson. The High Sheriff at the time was Richard Gibbons (now dead), a grandson of the first chief justice of the island, and president of the first council under DesBarres. Several of the persons named, like Leonard, Brown, Moore, Gesner, Gammell, were descendants of New England families.

Few romances have had their scenes in Cape Breton. W. C. McKinnon, a relative of the W. McKinnon who was provincial secretary and clerk of the council in 1792, wrote several remarkably hysterical books: "St. Castine: a Legend of Cape Breton" (Cape Breton, 1850); "Frances; or, Pirate Cove" (Halifax, 1851); "St. George; or, the Canadian League" (Halifax, 1852). See Morgan's "Bibliotheca Canadensis." Mr. McKinnon subsequently atoned for his youthful vagaries in writing such tales of murder, rapine and intrigue by becoming a clergyman of the Methodist Church. C. W. Hall, a member of the Massachusetts bar, who was born in Prince Edward Island, wrote "Twice Taken: an historical romance of the Maritime Provinces" (Boston, 1867). It records the fall of Louisbourg, and is an improvement on the former works. See *ibid.*

In the 'Canadian Archives' for 1891 there is a list of loyalist families who wished in 1784 to emigrate to Cape Breton (p. 21). Also several letters from Lieutenant-Governor Macarmick with reference to the defenceless state of the island in 1790-93 (pp. 41-44).

S. E. Dawson's 'Handbook of the Dominion' (Montreal, 1888) contains an interesting historical and descriptive sketch of the island, pp. 88-98.

In 'The Dominion Monthly' (Montreal, 1869) there is an article on the island of Cape Breton, by John George Bourinot. In 'Stewart's Literary Quarterly Magazine' (St. John, N.B., 1870) there is an article by the same writer on "The Island of Cape Breton: Its History, Scenery and Resources." In 'The Canadian Monthly and National Review' (Toronto, 1874) he has also a paper on "The Old Forts of Acadia," in which a brief description is given of Louisbourg as it appeared in 1870. The same material is used in a paper in the 'Transactions of the Royal Society,' "Some Old Forts by the Sea," vol. i, sec. 2 (1883). The 'Transactions of the Geographical Society of Quebec' (vol. i, No. 2, 1881) contain a paper read before that society by the same writer on "Cape Breton, the Long Wharf of the Dominion," xiii, pp. 800. These several papers do not pretend to any special original research, but are only intended to give a present view of an island so interesting for its past history and natural beauty. In 'The Magazine of American History' for March, 1891, there is a paper by the same writer on "Once Famous Louisbourg." See also Belfast (Maine) 'Republican Journal,' Jan. 14, 1892, for article on "Louisbourg, 1891."

The geology of the island of Cape Breton has been investigated by eminent men like Sir W. Dawson and Mr. Richard Brown before the confederation of the provinces, and by Mr. Hugh Fletcher, Mr. Robb and other members of the able staff of the Geological Survey of Canada since 1867. Much information on the coal-fields of the island, in a popular and practical form, is contained in "Coal-fields of Cape Breton," by R. Brown (the historian of the island, London, 1871); "Coal-fields of Nova Scotia," by J. Rutherford (Newcastle-upon-Tyne, 1871); "Acadian Geology," by Dr. (now Sir W.) Dawson (London, 1868, and subsequent editions); "Mineralogy of Nova Scotia," by Professor How (Halifax, 1869). Elaborate reports on the coal and mineral deposits of the island will be found in the 'Reports of Progress' annually issued by the Geological Survey of Canada; see volumes for 1872-3, 1873-4, 1874-5, 1875-6, 1877-8, 1878-9, 1879-80, 1880-1-2; 1882-3-4 (especially valuable since it shows the great number of economic values in the island), 1887-8 (coal statistics of Cape Breton during 1887, Part II, Rep. S., 15, 16), 1888-89 (coal statistics of Cape Breton, Rep. S., 16-19). Not the least valuable portions of these reports are the chemical contributions by Mr. G. C. Hoffmann, chemist and mineralogist to the survey, on the work done in the laboratory, with the object of showing the economic value of the various specimens of minerals brought from the island. Statistics of the production, value of exports and imports of minerals in Cape Breton, as well as in other parts of Canada, are given annually in the reports of the survey. Geological maps accompany the reports whenever necessary to illustrate the subject. The annual reports of the department of mines of Nova Scotia contain complete accounts of the condition of the collieries of Cape Breton, with statistics of their output and sales. In addition to these reports, the reader may consult with advantage "Coal-mining in Nova Scotia" (Montreal, 1888), by Mr. E. Gilpin, F. R. S. C., M. Can. Soc. C. E, inspector of Nova Scotia mines, in which appear some interesting historical details. Another paper on the "Geology of Cape Breton" appears in the 'Quarterly Journal' of the Geological Society of London for November, 1886. See also, by the same, a paper on 'Manganese Ores of Nova Scotia" ('Trans. Roy. Soc. Can.' 1884, sec. 4), and a series of papers on the "Carboniferous of Cape Breton" ('Trans. N. S. Inst. of Nat. Sci.,' 1886, 1887, 1888), and on the "Minerals of the Carboniferous" (Jan. 14, 1889), and on the "Devonian of Cape Breton" (*ib.*, April 14, 1890).

XVI. Treaties and Proclamations Relating to Cape Breton.

A. Extracts from the Treaty of Utrecht, 1713.

The Treaty of Peace and Friendship between the Most Serene and Most Potent Princess Anne, by the Grace of God, Queen of Great Britain, France and Ireland, and the Most Serene and Most Potent Prince Lewis the XIVth, the Most Serene and Most Potent Christian King, concluded at Utrecht the 31st day of March, [11th April, new style], 1713.

XII. The Most Christian King shall take care to have delivered to the Queen of Great Britain, on the same day that the ratification of this treaty shall be exchanged, solemn and authentic letters or instruments, by virtue of which it shall appear that the island of St. Christopher's is to be possessed alone hereafter by British subjects, likewise all Nova Scotia or Acadie, with its ancient boundaries, as also the city of Port Royal, now called Annapolis Royal, and all other things in those parts which depend on the said lands and islands, together with the dominion, property and possession of the said islands, lands and places, and all right whatsoever, by treaties or by any other way obtained, which the Most Christian King, the Crown of France, or any of the subjects thereof, have hitherto had to the said islands, lands and places, and the inhabitants of the same, are yielded and made over to the Queen of Great Britain, and to her Crown, for ever, as the Most Christian King doth at present yield and make over all the particulars above said; and that in such ample manner and form that the subjects of the Most Christian King shall hereafter be excluded from all kind of fishing in the said seas, bays and other places on the coasts of Nova Scotia; that is to say, on those which lie towards the east within 30 leagues, beginning from the island commonly called Sable, inclusively, and thence stretching along towards the southwest.

B. Extract from the Treaty of Aix-la-Chapelle, 1748.

IX. . . . Whereas it is not possible, considering the distance of the countries, that what relates to America should be effected within the same time, or even to fix the time of its entire execution, his Britannic Majesty likewise engages on his part to send to his Most Christian Majesty, immediately after the exchange of the ratifications of the present treaty, two persons of rank and consideration, who shall remain there as hostages, till there shall be received a certain and authentic account of the restitution of Isle Royale, called Cape Breton, and of all the conquests which the arms or subjects of his Britannic Majesty may have made before or after the signing of the preliminaries, in the East or West Indies. . . . Provided, nevertheless, that Isle Royale, called Cape Breton, shall be restored, with all the artillery and warlike stores which shall have been found therein on the day of its surrender, comformably to the inventories which have been made thereof, and in the condition that the said place was on the said day of its surrender.

C. Extracts from the Treaty of Paris.

The Definitive Treaty of Peace and Friendship, between his Britannic Majesty the Most Christian King and the King of Spain, concluded at Paris, the 10th day of February, 1763. To which the King of Portugal acceded on the same day.

IV. His Most Christian Majesty renounces all pretensions which he has heretofore formed, or might form to Nova Scotia or Acadia, in all its parts, and guaranties the whole of it, with all its dependencies, to the King of Great Britain; moreover his Most Christian Majesty cedes and guaranties to his said Britannic Majesty, in full right, Canada with all its dependencies, as well as the island of Cape Breton, and all the other islands and coasts in the gulph and river St. Lawrence, and, in general, everything that depends on the said countries, lands, islands and coasts, with the sovereignty, property, possession and all rights acquired by treaty or otherwise, which the Most Christian King and the Crown of France have had till now over the said countries, islands, places, coasts and their inhabitants, so that the Most Christian King cedes and makes over to the said king and to the Crown of Great Britain, and that in the most ample manner and form, without restriction and without any liberty to depart from the said cession and guaranty, under any pretence, or to disturb Great Britain in the possession above mentioned. His Britannic Majesty on his side agrees to grant the liberty of the Catholic religion to the inhabitants of Canada; he will consequently give the most precise and most effectual orders that his new Roman Catholic subjects may profess the worship of their religion, according to the rites of the Romish Church, as far as the laws of Great Britain permit. His Britannic Majesty further agrees that the French inhabitants, or others who have been subjects of the Most Christian King in Canada, may retire with all safety and freedom wherever they shall think proper, and may sell their estates, provided it be to subjects of his Britannic Majesty, and bring away their effects, as well as their persons, without being restrained in their emigration under any pretence whatsoever, except that of debts or of criminal prosecutions; the term limited for this emigration shall be fixed to the space of eighteen months, to be computed from the day of the exchange of the ratifications of the present treaty.

V. The subjects of the King of France shall have the liberty of fishing and drying, on a part of the coasts of the Island of Newfoundland, such as it is specified in the XIIIth article of the treaty of Utrecht, which article is renewed and confirmed by the present treaty, except what relates to the Island of Cape Breton, as well as to the other islands and coasts in the mouth and in the gulph of St. Lawrence; and his Britannic Majesty consents to leave to the subjects of the Most Christian King the liberty of fishing in the gulph of St. Lawrence, on condition that the subjects of France do not exercise the said fishery but at the distance of three leagues from all the coasts belonging to Great Britain, as well those of the continent as those of the islands situated in the said gulph of St. Lawrence. And as to what relates to the fishery on the coasts of the Island of Cape Breton out of the said gulph, the subjects of the Most Christian King shall not be permitted to exercise the said fishery but at the distance of fifteen leagues from the coasts of the Island of Cape Breton; and the fishery on the coast of Nova Scotia or Acadia, and everywhere else out of the said gulph, shall remain on the foot of former treaties.

D. Proclamation of 1763—*Establishment of Cape Breton as a separate colony—Royal instructions respecting Cape Breton, etc.*

A document of interest in connection with the later history of Cape Breton is: "The Petitioner's Case. In the matter of the petition of certain inhabitants of the island of Cape Breton against the annexation of that island to the province of Nova Scotia. In the Privy Council. George C. Hardingham, Lincoln's Inn" (London, 1843). This is the case of the island as presented to the Privy Council of England and set forth by Henry Bliss, colonial counsel for the petitioners. It contains a long and accurate summary of historical facts from the voyages of Cabot and Gilbert until the final annexation of the island to Nova Scotia. This document is rare, and the copy in my possession was given me by the late Mr. Justice Dodd, a resident of Sydney and a son of the first chief justice of the island. I give from this document the following extracts from proclamations and other official papers relating to Cape Breton:—

On the 7th of October, 1763, the celebrated proclamation of the third year of the reign of George the Third was issued annexing the islands of St. John (now Prince Edward) and of Cape Breton to the government of Nova Scotia.

The following extracts from this proclamation relate to the present inquiry:

"We have thought fit, with the advice of our Privy Council, to issue this our Royal Proclamation, hereby to publish and declare to all our loving subjects that we have, with the advice of our said Privy Council, granted our

Letters Patent, under our Great Seal of Great Britain, to erect within the Countries and Islands ceded and confirmed to us by the said Treaty, four distinct and separate Governments, styled and called by the names of Quebec, East Florida, West Florida and Grenada, and limited and bounded as follows, viz.:

"First, the Government of Quebec, bounded," etc.

"Secondly, the Government of East Florida, bounded," etc.

"Thirdly, the Government of West Florida, bounded," etc.

"Fourthly, the Government of Grenada, comprehending the Island of that name, together with the Grenadines and the Islands of Dominica, St. Vincent and Tobago.

"And to the end that the open and free Fishery of our subjects may be extended to and carried on upon the Coast of Labrador and the adjacent Islands, we have thought fit, with the advice of our said Privy Council, to put all that Coast, from the River St. John's to Hudson's Streights, together with the Islands of Anticosta and Madelane, and all other smaller Islands lying upon the said Coast, under the care and inspection of our Governor of Newfoundland.

"We have also, with the advice of our Privy Council, thought fit to annex the Islands of St. John and Cape Breton, or Isle Royale, with the lesser Islands adjacent thereto, to our Government of Nova Scotia.

"We have also, with the advice of our Privy Council aforesaid, annexed to our Province of Georgia all the lands lying between the Rivers Attamaha and St. Mary's." . . . . . .

In 1784 (16th August), the province of Nova Scotia was divided by the king's letters-patent, constituting all the parts north of the Bay of Fundy a separate province, named New Brunswick, and appointing Thomas Carleton captain-general and governor-in-chief in and over the same.

In the same year (3rd September, 1784), letters-patent were also issued appointing Joseph Frederick Wallet DesBarres, Esquire, lieutenant-governor of Cape Breton and its dependencies, and directing him to "exercise and enjoy the said office of Lieutenant-Governor of our said Island and its dependencies, with such powers and authorities, and according to such directions as are or shall be expressed in our Commissions and Instructions to our Captain-General and Governor-in-Chief of our Province of Nova Scotia and our Islands of St. John and Cape Breton, now and for the time being."

Afterwards and about the same time also (11th September, 1784), the commission of the Governor of Nova Scotia was revoked and a new one issued to the same person, John Parr, Esquire, which, after reciting a former commission to him as governor-in-chief of Nova Scotia, including the island of Cape Breton, and excepting the island of St. John (Prince Edward), "which we had thought fit to erect into a separate Government;" and after further reciting that "His Majesty, in the ninth year of his reign, had been pleased to appoint Walter Patterson, Esquire, to be Captain-General and Governor-in-Chief in and over our Island of St. John and territories adjacent thereto in America," and had also "thought fit to erect that part of our Province of Nova Scotia lying to the northward of the Bay of Fundy into a separate Province by the name of New Brunswick," proceeds as follows: "We have thought fit to re-annex the Island of St. John and its dependencies to our Government of Nova Scotia;" and then goes on to revoke a former commission to the said governor-general of Nova Scotia, and also a former commission to Walter Patterson as governor-in-chief of St. John's Island; and, in the new commission to the governor-general of Nova Scotia, the description of its boundaries includes the Island of St. John as well as Cape Breton and all other islands within six leagues of the coast. And this new commission further thus pledges the faith of the Crown, and confers as well on the island of Cape Breton as on Nova Scotia and on the island of Prince Edward, separately, distinctly and respectively, full legislative power in these words: "And we do hereby require and command you to do and execute all things in due manner that shall belong to your said command and the trust we have reposed in you, according to the several powers and authorities granted or appointed you by the present Commission and Instructions herewith given you, or by such further powers, instructions and authorities as shall at any time hereafter be granted or appointed you under our Signet and Sign Manual, or by our Order in our Privy Council, and according to such reasonable laws and statutes as are now in force, or shall hereafter be made or agreed upon by you, with the advice and consent of our respective Councils and Assemblies of our Province of Nova Scotia and our Islands of St. John and Cape Breton, under your Government. And we do hereby give and grant unto you full power and authority, with the advice and consent of our said respective Councils, from time to time, as need shall require, to summon and call General Assemblies of the Freeholders and Planters within your Government, in such manner and form as has been already appointed and used, or according to such further powers, instructions and authorities as shall at any time hereafter be granted or appointed you under our Signet and Sign Manual, or by our Order in our Privy Council;" and further the commission proceeds: "And our will and pleasure is, that the persons thereupon duly elected by the major part of the freeholders of the respective Counties and Places, and so returned, shall before their sitting take the oaths mentioned in the first recited Act of Parliament altered as above, as also make and subscribe the aforementioned declaration, which oaths and declaration you shall commissionate fit persons, under our seals of Nova Scotia, St. John and Cape Breton, respectively, to tender and administer unto them; and until the same shall be taken and subscribed, no person shall be capable of sitting, though elected. And we do hereby declare that the persons so elected and qualified should be called and deemed the General Assembly of our Province of Nova Scotia, of our Island of St. John, and of our Island of Cape

Breton, respectively; and that you, the said John Parr, with the advice and consent of our said Councils and Assemblies, or the major part of them respectively, shall have full power and authority to make, constitute and ordain laws, statutes and ordinances for the public peace, welfare and good government of our said Province and Islands, and of the people and inhabitants thereof, and such others as shall resort thereunto, and for the benefit of us, our heirs and successors."

An instruction appears also to have been given to the said governor-general of a corresponding date, to the following purport, viz.: "And whereas the situation and circumstances of our Island of Cape Breton will not at present admit the calling of an Assembly, you or our Lieutenant-Governor of our said Island shall, until it appears expedient to call such Assembly, in the meantime make such rules and regulations, by the advice of our Council for the said Island, as shall appear to be necessary for the peace, order and good government thereof, taking care that nothing be passed or done that shall any way tend to affect the life, limb or liberty of the subject, or to the imposing of any duties or taxes, and that all rules and regulations be transmitted by the first opportunity after they are passed and made for our approbation or disallowance."

Further instructions from his majesty to the governor-general of Nova Scotia are found in the following words, viz.: "It is nevertheless our will and pleasure that due care be taken in all laws, statutes and ordinances passed in our Province of Nova Scotia that the same do not extend to our Islands of Prince Edward (formerly St. John's) and Cape Breton, under colour or pretence that our said Islands are included in this our Commission to you and are parts of our Government of Nova Scotia."

The same instructions add further: "And it is our will and pleasure, and we do hereby declare and ordain, that all and singular the powers, authorities and directions in and by this our Commission given and granted to you, so far as the same extend and have relation to our Islands of Prince Edward and Cape Breton and their respective dependencies, shall be executed and enjoyed by you, or the Commander-in-Chief of our Province of Nova Scotia, at such times only as he or you shall be actually upon the spot in either of our said Islands, but that at all other times all and singular the said powers, authorities and directions shall be executed and enjoyed by such persons whom we shall respectively appoint to be our Lieutenant-Governors of said Islands."

E. Proclamation re-annexing Cape Breton to Nova Scotia.

"A Proclamation by His Excellency Lieutenant-General Sir James Kempt, G.C.B., Lieutenant-Governor and Commander-in-Chief in and over His Majesty's Province of Nova Scotia and its dependencies, etc.

"J. Kempt.

"Whereas his Majesty, with a view to promote the welfare of his faithful and loyal subjects of Nova Scotia and Cape Breton, hath been graciously pleased to direct that the island of Cape Breton should be re-annexed to the Government of Nova Scotia, and the same island should from henceforth be and remain an integral part of the Government of Nova Scotia,

"I do therefore in pursuance of his Majesty's instructions, and by and with the advice of his Majesty's council, declare that the island of Cape Breton is, and from henceforth shall be and remain a several and distinct county of the province of Nova Scotia, to be called and known by the name of the county of Cape Breton, and to be represented, and the civil government thereof to be administered, in like manner as the other counties of the province are administered and governed.

"And in pursuance of his Majesty's instructions I have caused a writ, in the usual form, to be immediately issued, directed to the Provost-Marshal or his deputy, resident in the island, for the election of two members to serve in the General Assembly of Nova Scotia, being the number directed to be summoned to such assembly before the time when the said island was first separated from the province of Nova Scotia.

"And I do hereby, in obedience to his Majesty's commands, dissolve the council of the said island of Cape Breton.

"And that the peace and good order of the said island may be preserved, and justice duly administered therein, until more effectual provision shall be made by the legislature of Nova Scotia, or until further order shall be duly made therein, I do hereby authorize and require that all judges, justices of the peace, constables and other civic officers in commission in the said island, do continue in the execution of their respective offices, agreeably to the several ordinances passed by the governor and council of Cape Breton, and under which the colony, since its separation, has been hitherto administered.

"Given under my hand and seal at arms at Halifax, this ninth day of October, 1820, in the first year of his Majesty's reign, by his Excellency's command.

"Rupert D. George,

"God save the King."

Downing Street, June 2, 1846.

"My Lord,—

"With reference to your Lordship's despatch of the 16th May, with its enclosure, on the question of the legality of the annexation in 1820 of the island of Cape Breton to Nova Scotia, and to previous despatches on the same subject, I have now to inform your Lordship that the petition addressed to the Queen-in-council by certain inhabitants of Cape Breton, praying for the separation of that island from Nova Scotia, having, by her Majesty's

commands, been referred to the judicial committee of the Privy Council, the hearing was brought on on the 1st April, and was continued to the 2nd, 6th and 7th of that month, when counsel were heard on behalf of the petitioners; and the attorney and solicitor-general were likewise heard on behalf of the Crown. A report has since been made, which her Majesty was pleased to approve on the 19th May, by and with the advice of the Privy Council, stating that 'the inhabitants of Cape Breton are not by law entitled to the constitution purported to be granted to them by the letters-patent of 1784, mentioned in the above petition.' I have to request that you should make known this decision to the inhabitants of the colony under your charge.

"I have the, etc., etc.,

"W. E. GLADSTONE.

"Lt.-Governor Viscount Falkland."

XVII. AN OFFICIAL FRENCH STATEMENT OF THE MILITARY ESTABLISHMENT AT LOUISBOURG IN 1753.

The following statement is copied from the "Archives Coloniales de la Marine," Paris, and is mentioned in M. Marmette's summary ("Can. Arch.," 1887, p. 371) as "an important document":—

"Colonies—Isle Royale—General correspondence—1753—M. de Raymond, governor. Vol. 33, c. 11, folio 221."

LOUISBOURG, 1753.

"General enumeration of officers' quarters (pavilions), barracks, guardhouses, powder magazines, and all other buildings except provision stores in this place."

"*Officers' Quarters:*

"In this place there is only one building,[1] a pavilion, for the accommodation of officers, that generally known as the English quarters, situated on the platform (terre-plein) of the Queen's bastion. It has a length of 21 toises,[2] 14 ft. 6 in., and a breadth of 5 toises, 4 ft. 4 in. It was built entirely of wood—double thickness—by the English, with one story and a garret. It is covered with shingles and divided into 32 rooms of 16 ft. 6 in. in length and 13 ft. 6 in. in width each.

"Opposite the foregoing officers' quarters is a building with a length of 22 ft. 8 in. and width of 18 toises 5 ft., including a projection in front of 40 ft. in length and 3 ft. 10 in. in width. It was constructed in wood by the English, for the purposes of an hospital, and is covered with shingles. At the present time it is of no use, and in fact is not completed in all essential respects for the object contemplated.

"*Barracks:*

"In this place there are three separate barracks for the accommodation of the soldiers. The two first, generally known as the English barracks, have a length of 32 toises 2 ft. 6 in., and a breadth of 5 toises 3 ft. 6 in. each. They stand at the entrance of the Queen's bastion, and are built uniform with one story and a garret, entirely of wood and covered with shingles. They are divided each into 32 rooms of 20 ft. 7 in. in length and 16 ft. 3 in. in width. Total, 64 rooms.

"The third block of barracks of the fort is situated at the entrance of the king's bastion, and has a length of 42 toises 2 ft. and a width of 7 toises. It is built entirely of masonry with one story and a garret, covered with shingles, and divided into 36 rooms, of which 26 are 18 ft. square, and 10 are 12 ft. x 18 ft.

"Connected with the barracks are two pavilions, the one known as the government pavilion and the other as the old commissariat or intendancy.

"The first pavilion has been always used by the government, and stands at the right end of the barracks. It is constructed of masonry, 8 toises 1 ft. in length and 7 toises in width, with subterraneous cellars, kitchens on the ground floor, and two stories for living rooms. It is covered with slate and is divided up as follows: On the ground floor are the kitchens and two apartments for the council.

"The first story comprises an office, a large ante-chamber or waiting room, a sleeping apartment, a dressing room, wardrobe and a private entrance for the master of the house. The second story is divided into three large rooms for the use of the servants. From this statement it is easy to judge that the accommodation is roomy and convenient in every respect.

"The second pavilion, known as the old intendancy, is situated at the other end of the barracks in question, and is of the same size as the one just mentioned. Like that it is built with a ground floor, but it has only a story and a garret above. It is covered with shingles and divided into eight rooms, of which four are low and four high.

"Two blocks of buildings, generally known as the Queen's gate barracks, were also built by the English, with a length of 15 toises 5 ft. and a width of 3 toises 4 ft. 8 in. They are situated, one to the right and the other to the left, on this side of the guardhouse of the gate in question. They are slightly built of wood with a garret only, covered with shingles, and divided each into five rooms of 18 ft. square.

"It is noticeable that these barracks were built on a bottom of stone masonry, in a very flimsy manner and entirely in wood. It is then easy to understand that they are very cold and only suited for lodging the soldiers temporarily during the summer, and thirty-six men could not live in one of these rooms without suffering many inconveniences.

"At the entrance of each of these rooms is a front (*avant-corps*) 6 feet in length and of as many in width, raised about 2 feet above the level of the street, and intended to modify the severity of the cold.

[1] All these buildings are here referred to as numbered on an official plan in the government office. I have not been able to obtain this plan, but their location can be as a rule fixed by reference to the general plan of the town at the end of this work.

[2] A toise was an old long measure in France, containing 6 French feet or 6 ft. 4.73 English measurement.

" *Buildings used as Lodgings:*

" The quarters of the commissary, facing the quay, are enclosed in a space of 33 toises 4 ft. 6 in. in length and of 13 toises 5 ft. in width, and are covered with shingles. This building is not large enough for all the offices connected therewith.

" The quarters of the engineer, standing behind the storehouse for provisions, take up a space of 27 toises 1 ft. 6 in. in length and 16 toises 4 ft. 4 in. in width. This establishment, composed of a ground floor of one story under the garret, of a court, a backyard, a stable, a pigeon-house and a garden, has many advantages.

" The house of the executioner, behind the guardhouse of the Queen's gate, is built entirely of wood, with a length of 24 ft. 6 in. and a width of 13 ft. 6 in. This place is vacant in the absence of an executioner.

" The hospital takes up considerable space; its several buildings contain four halls, two above and two below, and seventy-four beds for as many sick. The establishment connected with this hospital is considerable; apart from the four halls, there are buildings for the accommodation of the Fathers of Charity and of the staff generally.

" *Guardhouses;*

" There are in this place nine isolated buildings used as guardhouses, viz.:

" The two guardhouses of the Queen's gate, one to the right and the other to the left, built in masonry, 30 ft. in length and 20 in width, with a gallery of 6 ft. wide in front, and covered with slate.

" That on the right is divided into two equal parts, the one for the officer and the other as a storeroom for the supplies of the post.

" That on the left is also divided into two parts; in one, 20 ft. in length, are the soldiers, in the other are the latrines.

" The guardhouse of the Place d'Armes, in the covered way of the entrance of the King's bastion, is built of masonry, 34 ft. 4 in. in length and 20 ft. 3 in. in width, with a gallery of 6 ft. wide in front. It is covered with shingles, and divided into two parts, of which one, 9 ft. 6 in. in length, is used by the officers, and the other, 20 ft. long, by the soldiers.

" The guardhouse on the platform of the Dauphin bastion is 48 ft. in length and 29 in width, built of masonry, covered with shingles, and divided into two parts, of which one is for the soldiers and the other for the officer.

" The guardhouse at the right of the Dauphin gate is built of masonry, 16 ft. 6 in. in length by 15 ft. in width, and is covered with shingles.

" The guardhouse of the soldiers at the same gate, between the side face of the Cavalier or inner bastion and the rear of the surrounding wall, is constructed of masonry, 22 ft. 3 in. in length and 19 ft. 6 in. in width, and covered with shingles.

" The guardhouse of the Battery de la Grève, on the flank of the left face of the work in question, is built of masonry, 24 ft. in length and 22 ft. in width, with a large gallery of 9 ft. in the front, covered with shingles, and divided into two parts, one for the officer and the other for the soldiers, each of 24 ft. 10 in. In the rear, and running the length of the guardhouse is a wooden lean-to, 8 ft. in length, used as a storehouse for coal for heating the post.

" Two guardhouses at the Maurepas gate, one on the right and the other on the left, are built of masonry, 22 ft. 9 in. in length and 20 ft. 10 in. in width, with a gallery of 6 in. wide in front, and covered with shingles. The one on the right is divided into two parts; one of 18 ft. in width is for the use of the officer, and the other, of 7 ft., serves as a storeroom for the supplies of the post. At the rear there is also a lean-to of 21 ft. in length and 8 ft. 2 in. in width, built of wood, and used for the same purpose as the preceding.

" The other guard house on the left is set apart for the soldiers.

" *Powder Magazines, Armoury, and other Buildings Used by the Artillery:*

" The powder magazine in the Dauphin bastion has 30 feet 6 in. of length, and 34 ft. 8 in. of width, is built of masonry, with a bomb-proof vault, covered with shingles, and can hold 30,000 lbs. of powder by piling up the barrels as far as the vault allows, as is the case at present.

" The powder house on the platform of the Brouillan bastion was built by the English with brick of a half inch thickness, and covered with shingles. It is 45 ft. in length and 28 ft. 4 in. in width, surrounded by pallisades set at 12 ft. distance from its walls. It contains actually 98,000 lbs. of powder. The weak construction of this building has always made it dangerous.

" The armoury of 11 toises in length stands in the building numbered 41 on the plan and was built entirely of wood by the English, with 19 toises 3 ft. 6 in. in length and 5 toises 0 ft. 6 in. in width. It is furnished with four rows of arm racks, in which there are at present 4,018 guns.

" A shed standing opposite the building just named is built entirely of masonry, with a length of 28 toises and a width of 4 toises 8 in. It is covered with slate and is used to store gun carriages, platforms and such materials. Room has been made in this building for the forge and gunsmith.

" *Other Buildings:*

" At the foot of the interior slope at the angle of the flank of the Grave battery is a covered place (couvert) built entirely of wood, 21 feet in length and 12 in width.

" A similar covered building, at the angle of the left flank of the Maurepas bastion, is built entirely of wood, 13 ft. 9 in. in length and 7 ft. 9 in. in width.

" Another building like the preceding is placed at the angle of the flank of the Brouillan bastion and is 12 ft. 4 in. in length and 6 ft. in width.

" At the angle of the flank of the Princess's bastion is a small covered place for the use of the staff of the battery; it is raised to the height of the parapet of the right side of the bastion, for the purpose of exercising the gunners.

" Above the arch of the passage-way of the Queen's gate is a small building of 12 ft. 7 in. in length and 11 ft. 10 in. in width, built of masonry, and covered with slate. This building [adds the writer of the report] is not of any use at present; it has been intended as much to protect part of the arch of the gate's passage-way as to serve for munitions of war, and otherwise assist in the defence of this point.

" In the middle of the curtain between the Queen's and King's bastions is another building, over the arch of

the passage-way of a postern to the moat, constructed of masonry, 12 ft. in length and 18 ft. in width, and covered with slate. It is intended to answer the same purpose as the one last mentioned.

"Above the Maurepas gate is a small building, 12 ft. 7 in. in length and 11 ft. 10 in. in width, built of masonry and covered with slate. This building must have cost a good deal, on account of the quantity of freestone with which it is decorated, but at present it is falling to pieces and will be probably ere long pulled down and its materials used for other purposes.

"*Ice-House:*

"At the foot of the glacis of the angle of the right branch of the covered way of the entrance of the King's bastion is an ice-house of 22 ft. in diameter, built of masonry and covered with shingles.

"*Vaults:*

"Under each of the two flanks of the King's bastion are six underground vaults of 32 ft. in length and 12 ft. in width, and another extending from the two sides of the bastion. Altogether fourteen underground vaults, five of which are used as dungeons for prisoners.

"*Wooden Sentry-Boxes:*

"There are in the place forty-five sentry-boxes made of timber, placed at different parts of the rampart and in the interior of the town.

"*Stone Sentry-Boxes:*

"There are at the angles of the walls enclosing the different works within the place seven stone sentry-boxes.

"*Sluices:*

"There are in this place two sluices, one in the middle of the embankment (batardeau) of the Dauphin gate. Its passage of 2 ft. in width and 2 ft. 2 in. in height is closed by a sluice gate. It is used to drain the waters of the marsh which protects the curtain between the King's bastion and the Dauphin's bastion.

"The other is situated in the middle of the right face of the front, facing the port, with a passage of 3 ft. 6 in. in height and 2 ft. 8 in. in width; it serves at low tide to empty the waters of the pond.

"*Wells:*

"There are in the place nineteen wells, either public on the streets or private in the houses, all kept up at the expense of the king.

"*Brewery:*

"The allowance of beer each month for the soldiers renders a brewery necessary. As there was none in town at the time the French regained possession of the place, it was necessary to rent a house at the rate of 250 livres a year. But this house was a tumble-down affair, and it was necessary to build another, 8 toises 2 ft. 3 in. in length and 3 toises 4 ft. 3 in. in width, entirely of masonry, and furnish it with eight boilers. It stands on the street in the vicinity of the English barracks.

"A storehouse for wood and coal, required for the heating of the garrison, is situated on the edge of the pond opposite the wharf in that vicinity. The situation is exposed to the high tides, from which it is only protected by palisades, and was only chosen on account of the neighbourhood of the wharf and to avoid any long carriage.

"The king's garden is situated at the foot of the glacis of the left branch of the covered way of the entrance of the King's bastion, and surrounded by a picket fence. It is 30 toises 5 ft. in length and 21 toises 5 ft. in width

"Done at Louisbourg, 9th Oct., 1753."

[The signature to this document has been cut by the binder of the archives and cannot be read, but it was probably Commissary Prévost's. On the margin of the documents there are remarks as to the condition of the buildings, their furniture, and the accommodation they afforded. The writer states, in the course of his observations, that the garrison at that time (1753) was nominally composed of twenty-five companies of 50 men each, but five of these were constantly on duty elsewhere, even out of the island itself, and the total force was actually 1,000 men in barracks. The accommodation, according to the writer, was not sufficient for the comfort and convenience of the military. J. G. B.]

XVIII. Statements Respecting the Fisheries and Commerce of Cape Breton, 1745-1758.

From the "Archives Coloniales de la Marine," Paris. "Colonies—Isle Royale—General Correspondence—1775-1748—M. Bigot, Commissary," vol. xxvii, c. ii, folio 312.

"The importance of Cape Breton to the English nation is shown by the following computation (*supputation*) of the French fisheries, according to the latest data at hand.

"From the Gut of Canso down along the shore of Louisbourg, and from thence to the northeast part of Cape Breton, there was yearly employed at least 500 shallops. And these required, on sea and on shore, 5 men each, which amount to 2,500 men, and 60 brigantines, schooners and sloops, each of 15 men, making 900 men more, which together make 3,400 men.

"Allow the 500 shallops to catch 300 quintals of fish each in the summer season, and the whole is 150,000 quintals, and the 60 brigs, schooners, etc., each 600 quintals, which make 36,000 more. So that there is made at Cape Breton annually of fish 186,000 quintals.

"Now to carry this fish to Europe, to market, there must be employed 93 sail of ships of the burthen of 2,000 quintals each, one with the other, and each of these ships have at least 20 men, which are 1,860 seamen. And these, added to the 3,400 fishermen above, make 5,260 men employed at Cape Breton only in the fishery.

"At Gaspé, Quadre and other harbours mentioned in the following estimation there are six ships yearly, which, as they come out from France manned to catch their own cargoes of shallops, they haul up and leave in the country every winter, till they return the next spring, one with another may be allowed 60 hands. And it has always been allowed from St. Maloes and Granville they have at least 300 sail of these ships in the fishery, and fish at Petit Nord,[1] Fishante, Belle-Isle and the Gulph, which will, all computed as above (allowing those ships that so come out to make their own voyages to carry each 3,000 quintals), be as follows:

At Cape Breton	93	5,260	189,000
At Gaspay	6	360	18,000
At Quadre	6	360	18,000
At Port au Basques	6	360	18,000
At Les Foils [Trois?] Isles	3	180	9,000
St. Malo's men	300	18,000	900,000
	414	24,520	1,152,000

"Here it may be objected that of the 300 ships above from St. Malo (which they insist upon) some of them are of those ships above reckoned at Gaspay, Quadre, etc., which is well known to be so. But then no regard is here had to the ships so employed, among the rest, from St. Juan de Luz, Bayonne, Nantz, Havre de Grace, etc., which go annually into those parts on the same voyage, and are a great many more in number than those twenty-one ships above, and would, could an exact list be had, much swell the account.

"Besides all these there have been constantly from the river Sendre, Olone,[2] le Poitou, Havre, etc., 150 ships at least, the French say 200 sail, employed in the Mud Fishery or Mort Vert (as they call it) from sixteen to twenty-four men each, which carry home, upon an average, from 22,000 to 30,000 fish in number; which make, on the most moderate estimate, 150 sail of ships, and on a medium, at 20 men each, employ 3,000 men, and in the whole 3,900,000 fishes in Tale. These ships are fitted out in France for their voyages on the banks, and there tarry until they are laden, unless they meet with any disturbance, in which case they resort to Cape Breton for shelter and supplies, and from thence home to France. And it was thus frequent for them when they had made their voyages to go into Cape Breton for water especially, as they had no other port.

"In regard to the value of this branch of the trade it is necessary here to observe that there is hereby produced a large quantity of train oil, which France has always an immediate demand for at home for their woollen manufactures, lights, etc, and with which also their sugar colonies, that cannot do without it, are yearly supplied. It is certainly well known that they either do, or may at least make one hogshead of sixty gallons of oil, clear drawn off from the blubber, out of every hundred quintals of fish. And this, out of the quantity of fish before mentioned, will produce 11,490 hogsheads of oil. And, allowing that 4,000 fishes in number are equal to 100 quintals when cured, then the 3,900,000 mud fish, by the same rule, will yield 975 hogsheads of oil, which, added to the other, make 12,465 hogsheads of train oil, which are equal to 3,116 tons and a quarter.

	£	s.
"Now let the 1,149,000 quintals of fish be valued only at 10s. sterling per quintal, the prime cost usually at Newfoundland, and it is worth	574,500	00
"And to this allow 3s. sterling freight per quintal of it, in English bottoms, to market	172,350	00
"And then the fish only is worth	746,850	00
"And let the 3,116 and quarter tons of oil be valued at £18 sterling per ton, the amount of it is	56,092	10
"As to the mud-fish, it is generally sold in France at 1,000 livres per 1,000 fish; and then at 11d. sterling per livre their value is	178,750	00
"And thus it appears that one year's fishery of the French only is worth, sterling	981,692	10

which great branch of trade in a manner depends entirely on their possession of the island of Cape Breton, as it is impossible to carry it on without some convenient harbour of strength, etc., to supply, support and protect it; and it is now with us to determine whether they shall enjoy it or not."

[The foregoing computation of the French fishery (as I have given it) is found in English in "The Works of James Houstoun, M.D.," (London, 1753, pp. 370-376). Houstoun's correspondent, who gives an account of the siege of 1745, says that the computation "was given to General Pepperrell on the spot by such of ourselves who, at Canso and Louisbourg, have been eye-witnesses of it, and from their captains, etc., of their ships at different occasional conversations on comparing the French fishery with the English, and transmitted by the General to Great Britain, for the consideration of his Majesty in Council and our British Parliament." The computation appears to have appeared in various English pamphlets after the capture of Louisbourg in 1745. The following note on the subject from Dr. Justin Winsor corroborates the statement:

"'The Importance and Advantage of Cape Breton, etc.,' London, 1746 (which is by some attributed to Wm. Bollan), says, p. 84: 'Having in my possession 'A Computation of the French Fishery as it was managed before the Present War,' I should have inserted it here if I had not met with it in a pamphlet lately printed at Exeter, entitled 'An Accurate Journal and Account of the Proceedings of the New England Land Forces during the late Expedition against the French Settlements in Cape Breton.'

[1] Petit Nord was the name given to the northwestern waters and coast of Newfoundland. See Bellin's map of Terre-Neuve, Charlevoix, vol. ii. Quadre, Port aux Basques, Les Foils [Trois] Isles and Fishante were all places on that coast.

[2] Sables D'Olonne in France. The names in this computation are as a rule inaccurately given.

"'The Computation,' etc., is also referred to in 'The Great Importance of Cape Breton Demonstrated and Exemplified' (London, 1746), where (pp. 46-49), in a footnote, is given an extract from it, which corresponds exactly with the paragraphs in 'Dr. Houstoun's Memoirs,' which begin p. 370, 'From the Gut of Canso,' and end p. 376, at the bottom of the page."]

The following are extracts from the French archives, which give official and reliable information as to the value of the commerce and fisheries of Cape Breton at a later period than that in the mere computation or estimate just mentioned:

II.

"Ile Royale—General Correspondance—1753," vol. xxxiii, c. xi, folio 496.

"General statement of the vessels and shallops engaged in the fisheries of Ile Royale during the summer of 1752:

Place of Fishery.	On account of the inhabitants or vessels engaged in trade.	
	Sloops and schooners.	Shallops.
Louisbourg	46	24
Laurentbec	..	47
La Baleine	..	29
Le Petit Bras d'Or	..	11
Niganiche	..	16
L'Indienne	..	4
Scatari	..	14
Cabarus	..	3
	46	148

"We, the officers of the Admiralty at Louisbourg, certify to the accuracy of the foregoing statement this 10th of January, 1753.

"De la Borde.
"Neyracq."

III.

"Ile Royale—General Correspondence—1753," vol. xxxiii, c. xi, folio 495.

"Addition to the foregoing letter of the officers of the Admiralty of the 10th of January, 1753.

"Statement of the vessels arrived for the fishing and trade of the island, and of those which have been fitted out for France, the islands of America, and Canada during 1752:

Ports of Sailing.	Places of Arrival.		
	Louisbourg.	Niganiche.	Petit Degras.
Bayonne	5	..	..
St. Jean de Luz	4	1	1
St. Malo	10	3	..
Nantes	2	..	..
La Rochelle	6	..	..
Sables d'Olonne	4	..	..
Bordeaux	8	..	..
L'Orient	1	..	..
Cherbourg	1	..	..
Isles d'Amérique	57	..	..
Canada	17	..	..
Coasts of Boston [New England]	156	..	..
	272	4	1

"Vessels fitted out at Ile Royale:

Europe	11
Canada	4
America	18
	33

"We, the officers of the Admiralty at Louisbourg, certify to the accuracy of the foregoing statement.

"10th January, 1753.

"De la Borde.
"Neyracq."

IV.

"Ile Royale—General correspondence, 1753—vol. 33, c. 11, folio 437.

"M. Prévost, intendant, 24th December, 1753, on the state of the fisheries and trade of the island. To the minister at Paris.

* * * * * * * * *

"You will see with pleasure that there is an increase in the fisheries of 1753 over those of 1752, since the total product is 98,450 quintals of codfish and 1,154½ barrels of oil. The general value of these fisheries ought to reach, according to the present estimate, the sum of 2,084,450 livres, which exceeds that of 1752 by 312,490 livres—the estimate for that year having been only 1,771,960 livres.

* * * * * * * * *

"The commerce with France shows an increase in the imports, which are valued at 1,063,337 livres 6 sous 2 deniers, and the exports at 735,805 livres 12 sous 2 deniers, or 327,531l. 14s. less than the imports. It does not, however, follow that this whole sum is owing to the kingdom. The people of the island have an interest in the cargoes of the ships from France, and a large quantity of goods is sent for sale on commission to supply the warehouses during the winter. It is quite possible, however, that the colonial merchants still owe something every year to their agents in France, who are frequently in the habit of making them advances. But this cannot be done on a very considerable scale, for I have heard of no complaints on this score.

"Canada has not exported any goods during this year to the colony, but she has imported them to the value of 111,157l. 19s. This amount has not yet been returned on account of an arrangement made for bills of exchange in October. The correspondants of our merchants, however, hold out hopes that they will make remittances next spring. It is to be hoped that this will be the case, for such delays can only tend to lower credit and derange trade.

"You will also notice, my Lord, that the imports of merchandise from the Windward and Leeward islands have reached the sum of 1,112,883l. 3s., and the exports to the same, 673,863l. 19s. 6d. The imports consequently exceed the exports by 439,019l. 3s. 6d. This excess will always exist on account of the considerable equipment that the people make nowadays for the islands. The outlays being of little importance compared with the returns, especially when they make good voyages, it is absolutely necessary that the outfits of the spring form an important item in the imports. Here we clearly see something of the advantages of the trade between Cape Breton, Martinique and Gaudaloupe. This year the number of sails for these parts of America have been exceptionally large. Many sloops and schooners [batteaux et goëlettes [1]] have been fitted out, and there are still some ready to go out in January and February. They are only waiting to sail until the supply of cod made this autumn is exhausted.

"This trade would be extremely lucrative and advantageous to this country, if the vessels of western Newfoundland (Petit Nord) and Gaspé had not undertaken to send, since two or three years, a great quantity of codfish into the islands, and there is no other way of sustaining Ile Royale than by imposing a tax on American fish or by increasing it on the fish of North Bay and Gaspé.

"As to the English trade, I have obeyed your orders, and you will see also by the statements you have asked for that the imports exceed the exports by 258,398l. 30s. 1d., including the price of the vessels bought, viz., 284,230l., in the place of 270,000l., as estimated at first. . . . As respects the purchase of vessels, our merchants still owe the English on this account 129,300l., which is to be paid in the month of June next year in the shape of rum and syrups."

ERRATUM.

P. 248, 10th line from foot, for *Frederick Wallis Desbarres*, read Major F. Wallet Desbarres.

[1] Chabert ("Relation du Voyage sur les Côtes de l'Amérique Septentrionale," pp. 44, 113) says that a batteau had a tonnage of from 80 to 100, and only one mast (a sloop in fact); a goëlette was about the same size, but had two masts. This class was chiefly used in the Cape Breton fisheries. A chaloupe was a large undecked fishing boat, with two masts and three sails, and fitted for rowing; generally like the "whale-boats" in use now on the coasts of the island.

The following important table—which I translate also into English—is appended to the foregoing report:

ISLE ROYALE 1853.	PESCHE DE MORUE — COD FISHING				COMMERCE — TRADE					
	Habitans Belonging to the Island.		Vaisseaux To other places.		Vaissaux venus de France Vessels from France		Batimens des habitans pour le cabotage et le commerce — Vessels of the Island, coasting & trading	Batiments venus du Canada — Canadian vessels	Batiments venus des Isles de l'Amérique — Vessels from the Islands of America	Batiments venus de la Nouvelle Angleterre — Vessels from New England
Havres ou se fait la pesche et le commerce — Harbours in which the fisheries and trading have been carried on.	Chaloupes — Shallops	Goëlettes — Schooners	Chaloupes — Shallops	Goëlettes — Schooners	En Traité et Pesche — Trading and Fishing	En Traité seulement — Trading only				
Daspé										
Anse du Ridsagne										
Nagassou										
Niganiche	17		25		3					
Port Dauphin							1			
Petit Bras dor	16									
L'Indienne	5									
Scatary	16		4	1	2					
La Baleine	18									
Petit Laurentbec	51		3		1					
Louisbourg	19	35	9	13	10	37	57		54	150
Baye de Gabory	3									
Havre à fourché										
Saint Esprit	9									
Archéoui										
Isles Michaux										
Petit Degras	24									
Nerichac										
Port Toulouze							14			
Isle St. Jean	25						8			
Isles de la Magdeleine	2	1								
L'Ardoise	4									
Total	209	36	41	14	16	37	80		54	150

REMARQUES.

Quoy qu'il y ait des ports sur cette carte où il n'y a point des chaloupes portées il y en à cependant plusieurs qui y ont fait la pesche d'automne.

Il y a eu 5 Batimens de construit cette année dans l'Isle et 34 goëlettes et Batteaux et un navire achetés des Anglais. Fait à Louisbourg ce 24 xbre. 1873. Prévost.

REMARKS.

Though there are some ports on this table where no shallops are given, nevertheless in several of them a fall fishing was carried on.

Five ships were built this year in the island and 34 schooners and sloops, and one vessel bought from the English. Done at Louisbourg this 24th of Decembr, 1753. Prévost.

RÉCAPITULATION DE LA PESCHE DE 1753.

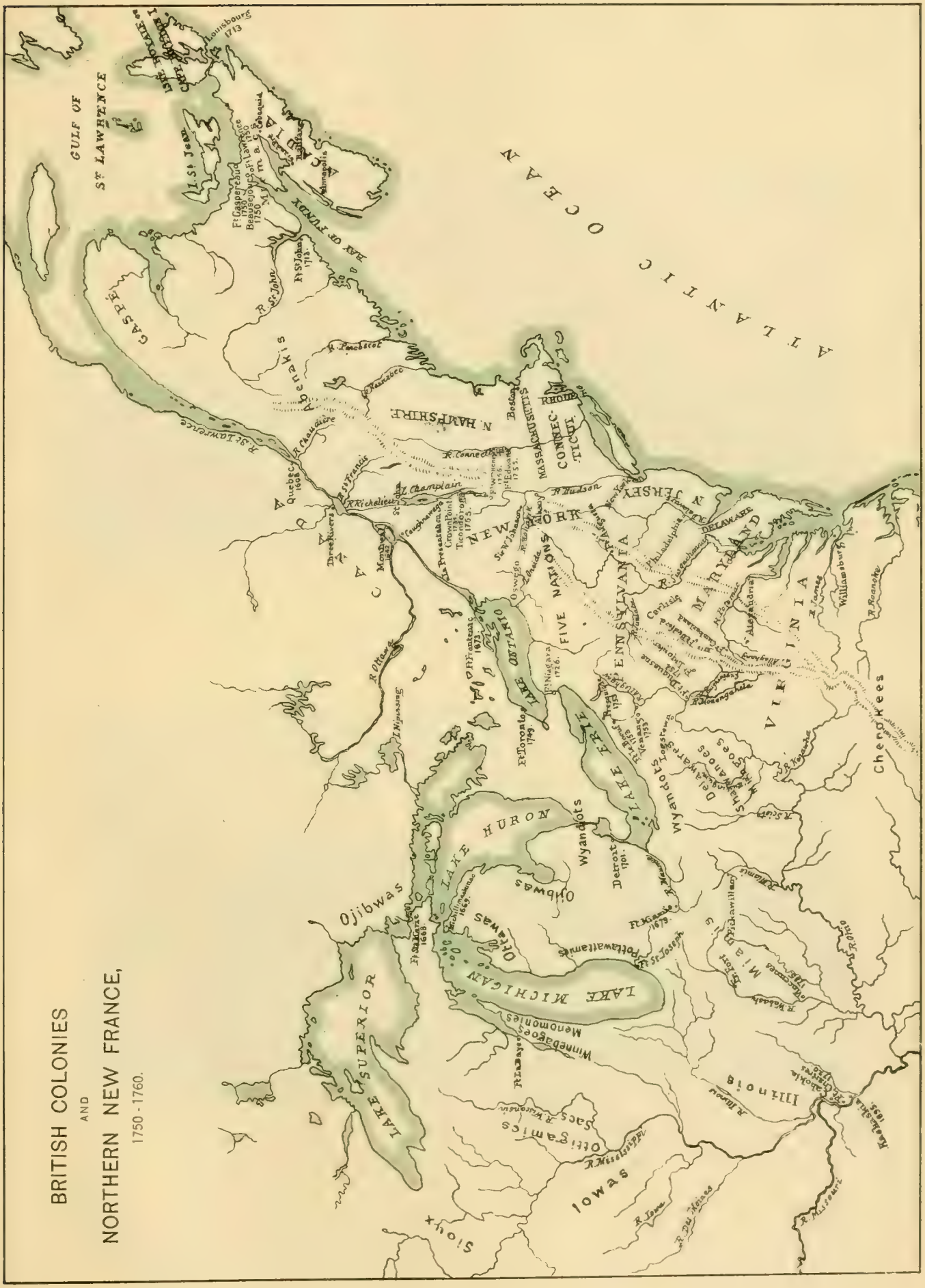
250 chaloupes des habitans et vaisseaux ont peschées pendant l'été de la présente année 1753 et 230 qtaux—l'uns portant l'autre	57500	qtaux.
50 Batteaux et Goëlettes des habitans et V'aux ont peschés pendt idem 720 qtaux—L'uns portant l'autre	36000	"
110 chaloupes des habitans ont fait pendt l'automne de l'année d're a 49 qtaux—L'une portant L'autre	4950	"
Les 98450 quinteaux de Morüe ont produit à Raison d'une Barrique d'huille par 100 quintaux	984½	bariques.
Et il a été fait aux Isles de la Magdeleine par la tuerie des vaches marines	170	"
	1154½	"
Produit de la pesche en France :—		
98450 quinteaux de morüe ont produit à 20 liv. le quintal cy	1,969,000	liv.
1154 bariques d'huille de poisson à 100 liv. la Barique	115,450	"
Total	2,084,450	"

SUMMARY OF THE FISHERIES IN 1753.

250 shallops of the Island and elsewhere have fished during the summer of the present year and each has caught on the average 250 quintals.	57,500	quintals.
50 sloops and schooners of the Island and elsewhere have fished during the same time, each averaging 720 qtls	36,000	"
110 shallops of the Island have fished in the fall, each averaging 49 qtls.	4,950	"
The 98,450 qtls of codfish (enumerated above) have produced at the rate of one barrel of oil for 100 qtls	984½	barrels.
At the Magdalen Islands, the sea-cows have produced	170	"
	1145½	"
Product of the fisheries in France :—		
98,450 qtls of codfish have brought @ 20 liv. the qtl	1,969,000	liv.
11,54 barrels of oil @ 100 liv. the barrel	115,450	"
Total	2,084,450	"

[A livre in this year was worth about 1 franc 66 cents. (See Cheruel, Dictionnaire historique des Institutions de la France, art. Monnaie). In English sterling the value of the catch of 1753 was about £50,000.]

The foregoing documents have been copied from the Colonial archives, under the direction of M. Gambecq, to whom and Mr. Hector Fabre, Agent-General of Canada, at Paris, the author is under obligations.



To illustrate Dr. J. G. Bourinot's Paper on Cape Breton.

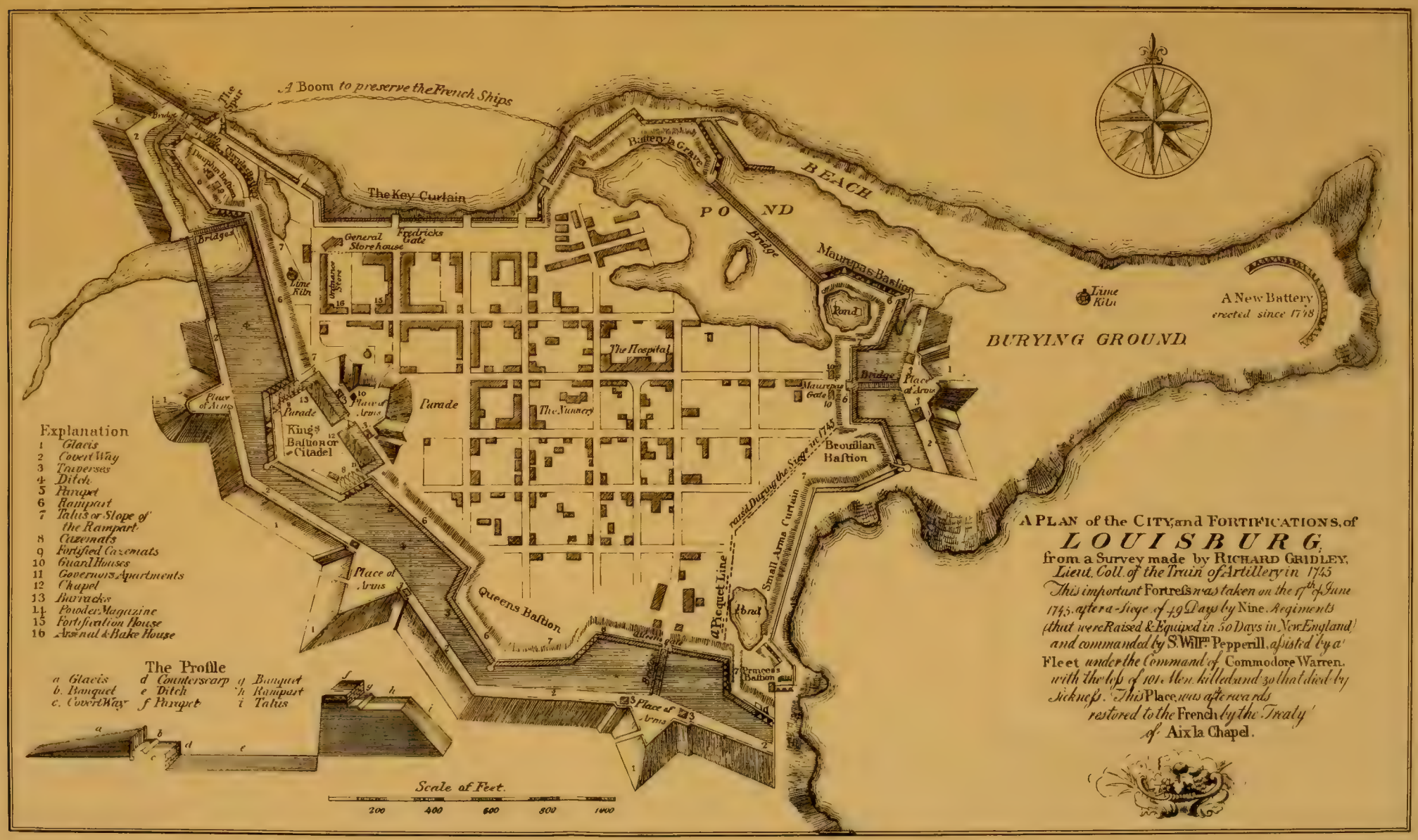
LOUISBOURG.

VILLAGE OF LOUISBOURG, 1891.

RUINS OF CASEMATES AT LOUISBOURG, 1891

To illustrate Dr. J. G. Bourinot's Paper on Cape Breton.

To illustrate Dr. J. G. Bourinot's Paper on Cape Breton.



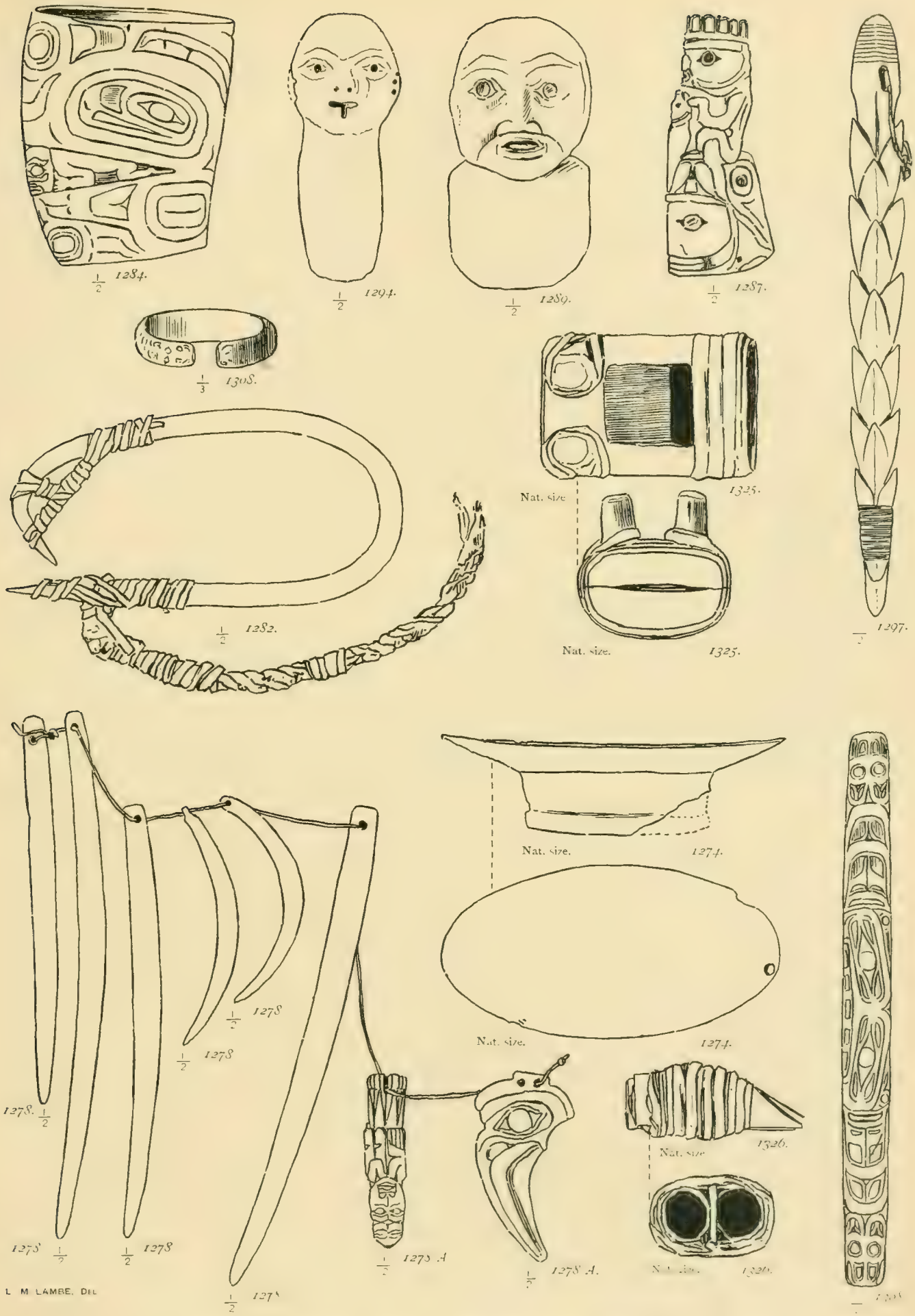
To illustrate Dr. J. G. Bourinot's Paper on Cape Breton.

To illustrate Dr. J. G. Bourinot's Paper on Cape Breton.

MAP SHEWING THE LIMITS OF THE SHUSWAP PEOPLE OF BRITISH COLUMBIA,

WITH THE PRINCIPAL SUBDIVISIONS.

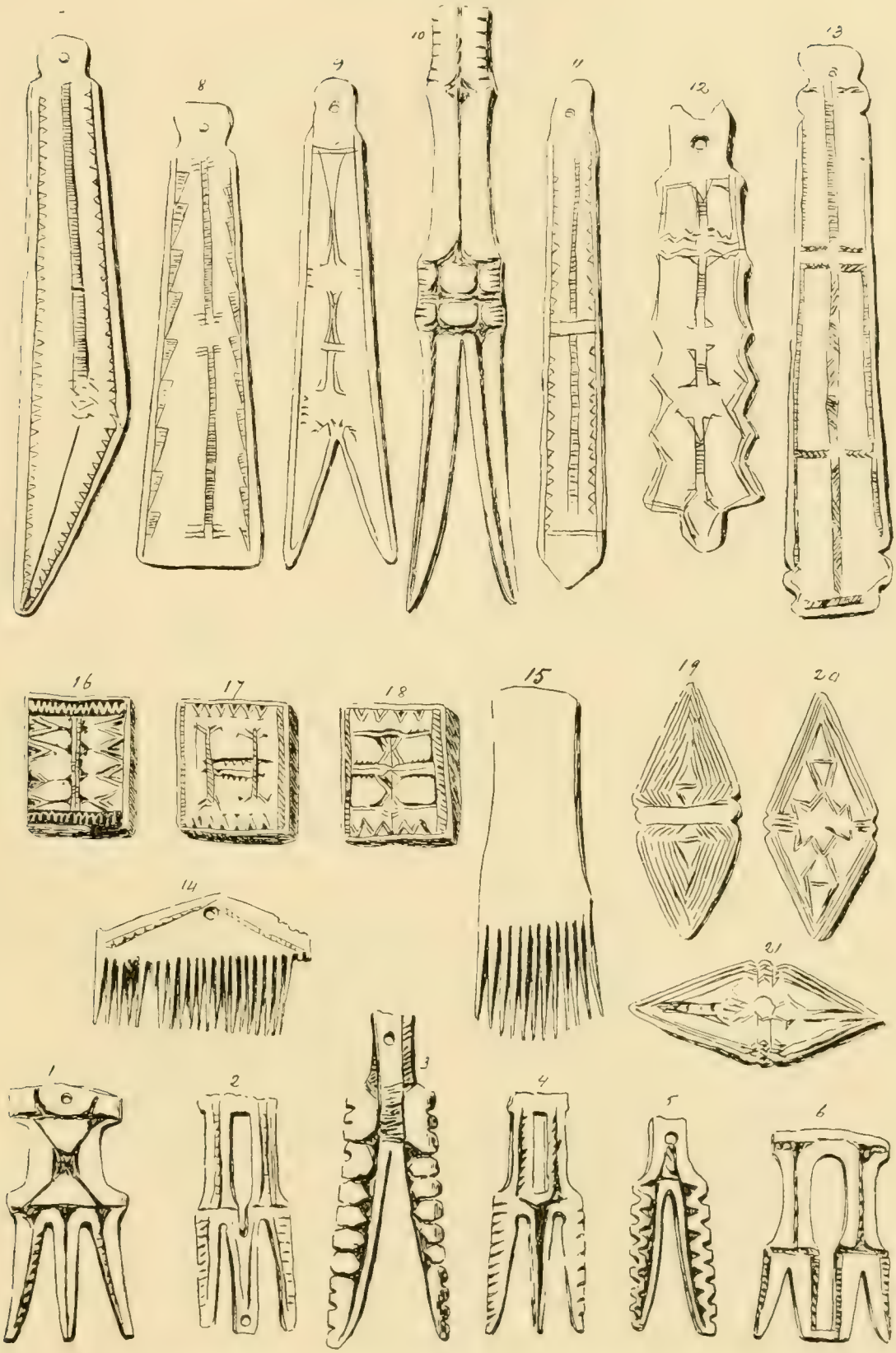
To illustrate Dr. G. M. Dawson's Paper on the Shuswap People.



To illustrate Mr. Mackenzie's Paper on Implements from Queen Charlotte Islands.

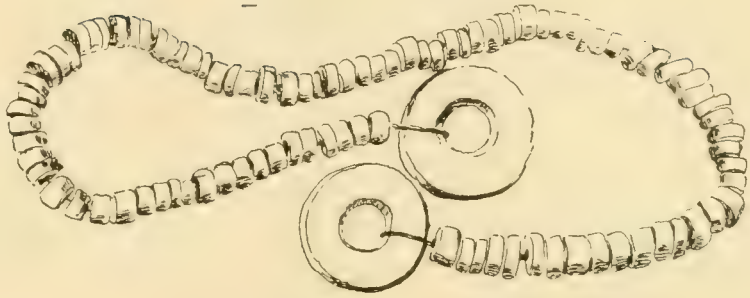
To illustrate Mr. Mackenzie's Paper on Implements from Queen Charlotte Islands.

INDIAN ORNAMENTS

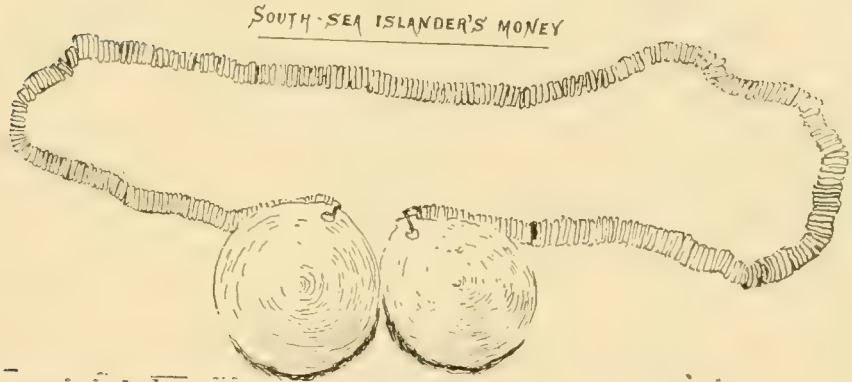


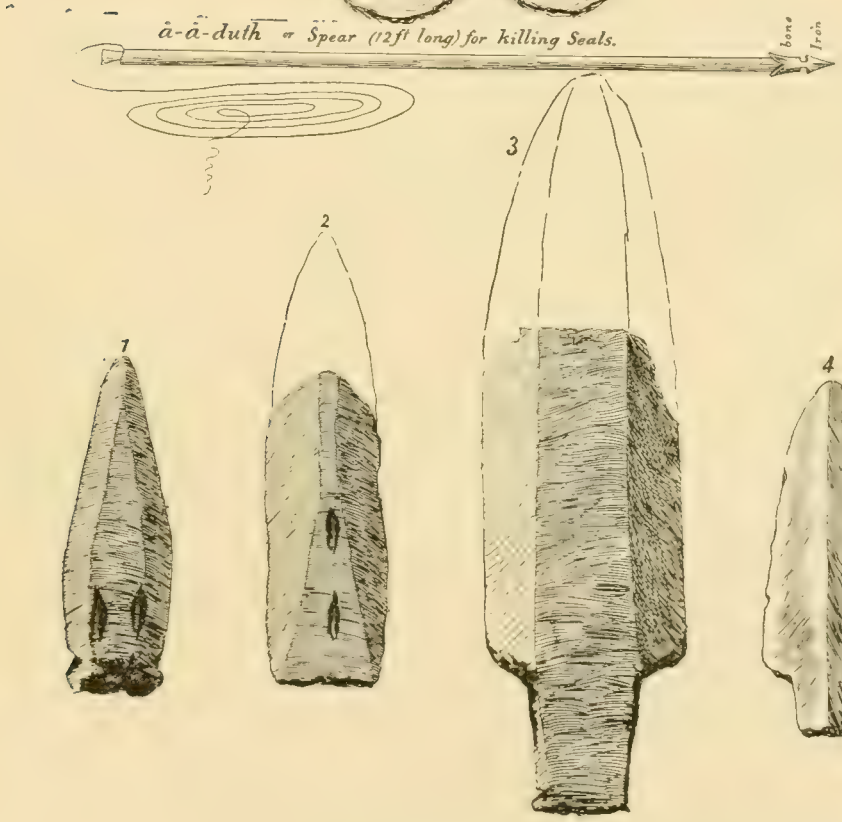
To illustrate Rev. Dr. Patterson's Paper on the Indians of Newfoundland.

RED INDIAN WAMPUM STRING



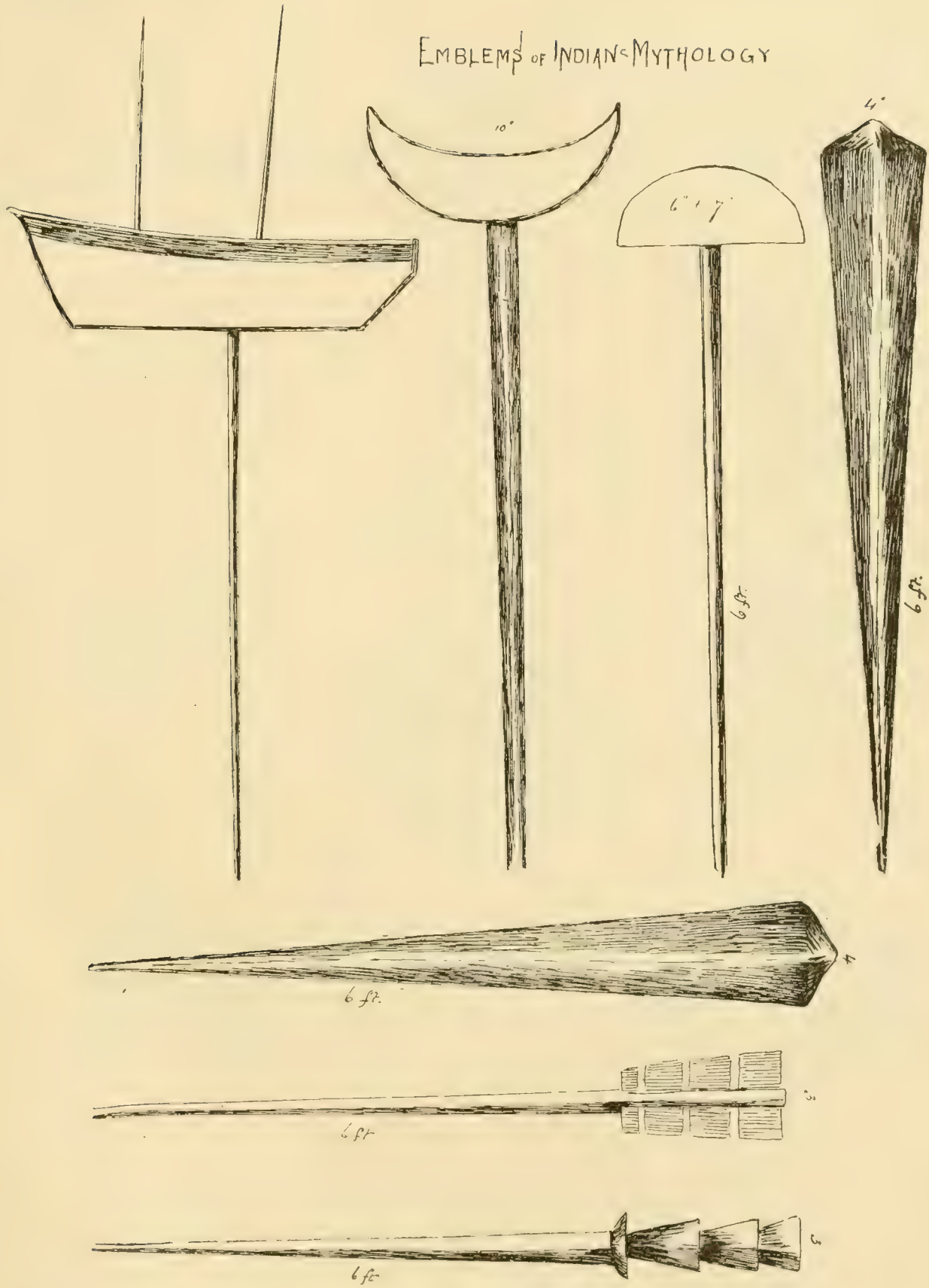
SOUTH-SEA ISLANDER'S MONEY



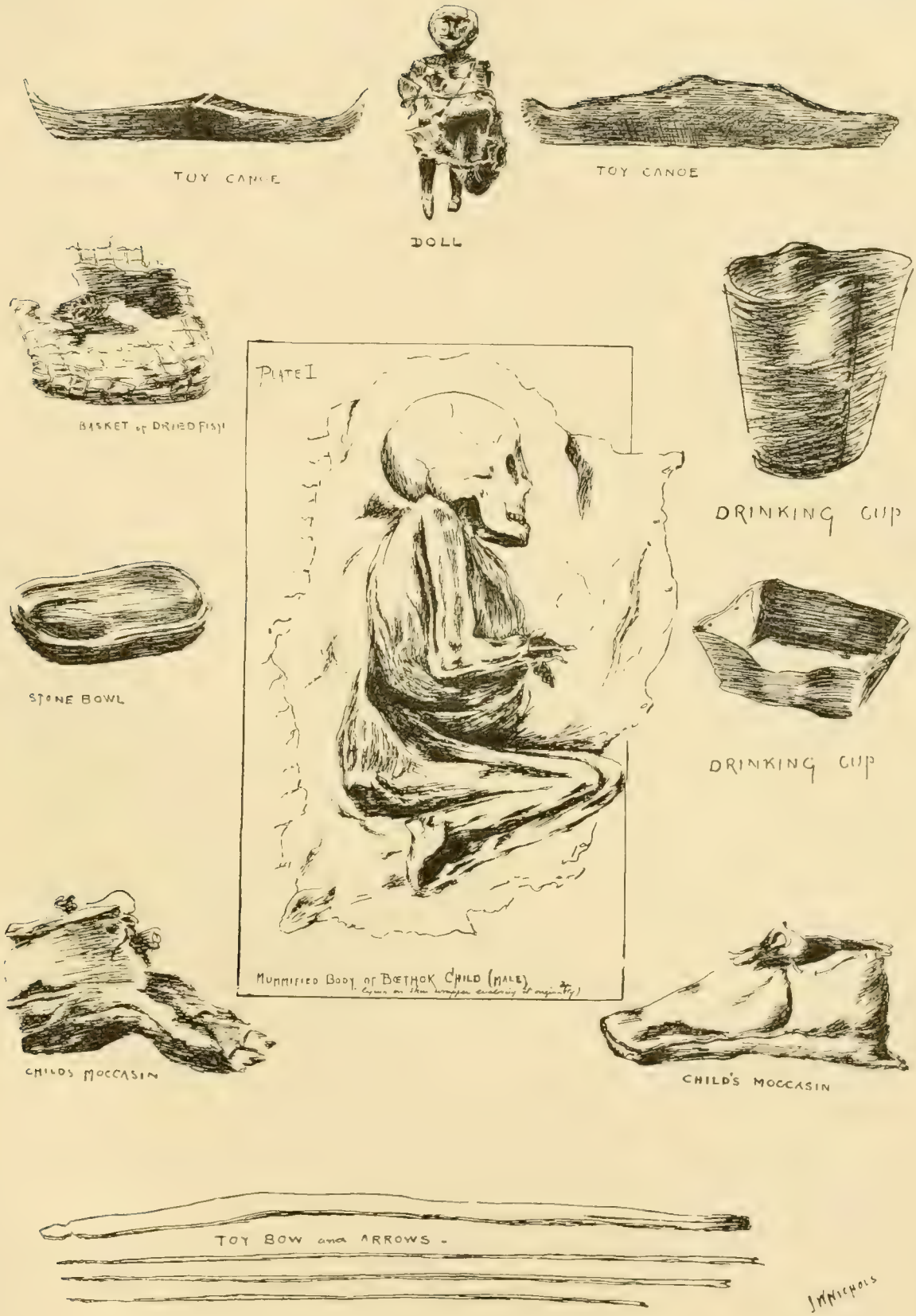


Nos. 1 and 2. Perforated Harpoon Points; polished slate.
No. 3.—Spear Head; polished slate.
No. 4.—Arrow Head; polished slate.

To illustrate Rev. Dr. Patterson's Paper on the Indians of Newfoundland.



To illustrate Rev. Dr. Patterson's Paper on the Indians of Newfoundland.



To illustrate Rev. Dr. Patterson's Paper on the Indians of Newfoundland.

ROYAL SOCIETY OF CANADA

TRANSACTIONS

SECTION III.

MATHEMATICAL, PHYSICAL AND CHEMICAL SCIENCES.

PAPERS FOR 1891.

I. — ADRESSE DU PRÉSIDENT, Mgr T.-E. HAMEL.

De la certitude dans les sciences d'observation.

MESSIEURS,

Y a-t-il moyen d'arriver à la certitude dans les sciences d'observation ? Quelle espèce de certitude y peut-on avoir ?

Ces questions peuvent paraître étranges à ceux qui s'occupent avec amour de l'étude des sciences ; elles ont toutefois leur raison d'être et ne sont pas inopportunes.

Il arrive assez souvent, même de nos jours, que des personnes, instruites d'ailleurs, mais ayant plutôt cultivé les études historiques ou philosophiques que les études scientifiques proprement dites, adoptent et défendent avec acharnement certains systèmes anciens ou les idées de certains philosophes de l'antiquité, dont la science moderne prétend avoir démontré la fausseté. Aux affirmations et aux objections de la science moderne on oppose comme fin de non recevoir, soit les contradictions successives de la science, qui renverse aujourd'hui avec autorité les systèmes qu'elle avait affirmés hier avec non moins d'autorité, soit les contradictions simultanées des savants qui, de nos jours comme dans le passé, ne s'accordent pas toujours sur l'explication des mêmes phénomènes.

De là la question qui se pose tout naturellement : y a-t-il réellement moyen d'arriver à la certitude dans les sciences d'observation ? ou bien, sommes-nous condamnés à constamment errer de système en système, sans jamais pouvoir nous arrêter et dire avec quelque certitude : la vérité est là ?

Je laisse de côté les sciences purement psychologiques, qui m'entraîneraient trop loin, et je me borne ici aux sciences d'observation dans l'étude du monde physique inorganique et organique en dehors de l'homme.

Commençons d'abord par faire une distinction capitale sans laquelle on est exposé à jouer sur les mots faute de s'entendre.

Les sciences d'observation se composent de deux parties essentiellement distinctes : la constatation des faits, et l'explication de ceux-ci.

Si l'explication des faits est très souvent une simple hypothèse plus ou moins plausible en attendant mieux, il n'en est pas de même de la constatation des faits, qui est susceptible de toute la certitude désirable.

Naturellement, comme il s'agit de faits contingents, au sujet desquels on ne peut conclure que du particulier au général, cette certitude a ses progrès et par conséquent ses degrés. En effet, la constatation, par quelques observateurs en nombre restreint, de certains faits se reproduisant toujours de la même manière, ne crée d'abord qu'une présomption ; puis, par le progrès des observations, on arrive à la probabilité ; enfin la diversité des méthodes d'observation, le nombre croissant des observateurs, l'accord unanime de ceux-ci, et le contrôle qu'ils exercent les uns sur les autres, finissent par donner une certitude morale qu'on ne saurait révoquer en doute sans pécher contre la raison.

Ainsi la pesanteur des corps à la surface de la terre, la gravitation universelle, le fait de la réflexion, de la réfraction simple et double, de l'interférence et de la polarisation de la lumière, les phénomènes magnétiques et électriques, la corrélation des agents physiques, sont devenus d'une évidence telle qu'on ne saurait les nier sans déraisonner.

Ce que je viens de dire de l'observation des faits, je puis le répéter pour la constatation des lois qui régissent les différents phénomènes naturels. Ces lois en effet ne sont que l'expression d'observations et de mesures multipliées, contrôlées, vérifiées par l'unanimité des observateurs. Ici encore, naturellement, la certitude relativement aux lois des phénomènes a dû passer par toutes les phases de la présomption, de la probabilité plus ou moins vague d'abord, jusqu'à la certitude morale qui commande l'assentiment des intelligences. Cette phase d'enfance et de progrès dans la constatation des lois physiques ne doit pas infirmer la certitude définitive, parce que celle-ci n'est proclamée que lorsque le doute cesse d'être raisonnable. D'ailleurs la plupart de ces lois, susceptibles d'énoncés mathématiques, reçoivent des sciences mathématiques un contrôle des plus précieux. Car le calcul permet d'atteindre des conséquences éloignées et délicates, souvent imprévues, et qui deviennent une vérification presque absolue.

Toutefois ce genre de preuve et de vérification suppose des connaissances spéciales que tout le monde n'a pas. Bien peu de personnes sont en état de vérifier les conséquences mathématiques auxquelles sont arrivés Euler, Newton, Huyghens, Bernouilli, Leibnitz, Laplace, Cauchy, Abel et autres. Est-ce à dire que ceux qui n'ont pas approfondi les sciences du calcul soient en droit de nier l'exactitude des lois pour lesquelles leur défaut de connaissances ne leur permet pas ce mode si sûr de vérification ? Non certes, car l'ignorance ne saurait donner le droit de parler ; et, si savant que l'on puisse être dans certaines branches des connaissances humaines, le fait d'être incompétent dans une seule, — si celle-ci est fondamentale et propre à la science qu'il s'agit d'étudier, — suffit pour empêcher tout homme, jouissant de sa raison, de se prononcer à l'encontre de ceux qui ont cette compétence.

Dans ce cas, on peut bien n'avoir pas confiance dans les adeptes de la science objet du différend ; on peut même dire que l'on n'est pas convaincu, parce qu'on n'est pas en état de saisir la solution des difficultés qu'on entrevoit ; on sera alors raisonnable ou déraisonnable dans son incrédulité, mais du moins restera-t-on dans les limites des droits de la liberté.

Il en serait autrement si, parce que l'on n'est pas en état de comprendre une démonstration, on allait jusqu'à en nier les conclusions. Je dis plus : l'obstination à vouloir parler à l'encontre de preuves que l'on n'est pas en état de saisir n'est pas seulement un acte déraisonnable, mais elle est de plus l'indice d'un jugement qui n'est pas sain. Qui parle sans savoir fait douter légitimement de son raisonnement dans les choses qu'il sait.

Est-ce à dire que les affirmations de ce que l'on est convenu d'appeler la science moderne doivent être admises sans réserve ? Certes non, car beaucoup de savants dans les sciences naturelles ne raisonnent pas mieux que certains de leurs contradicteurs dans les sciences philosophiques, et concluent, eux aussi, au delà ou à côté des prémisses. Seulement je dis qu'il y a un moyen sûr de faire le triage entre ce qui est certain et ce qui n'est qu'hypothétique ou fantaisiste dans ces affirmations.

Quel est donc ce moyen ? C'est de constater si les conclusions énoncées sont bien les conséquences légitimes des faits. Evidemment cette constatation ne pourra pas se

faire par le premier venu ; mais, ne l'oublions pas, je nie au premier venu le droit de se prononcer, et j'exige, comme facteur essentiel du débat, la compétence suffisante.

Voyons donc quelles sont les règles auxquelles doivent s'astreindre les travailleurs scientifiques pour commander l'assentiment des intelligences. On pourrait dire qu'elles se réduisent à une seule, laquelle consiste à ne jamais prendre pour point de départ un fait ou un principe douteux, et à n'en jamais déduire des conclusions qui ne découlent point des prémisses.

A ce point de vue, les sciences mathématiques elles-mêmes, bien qu'elles soient appelées sciences exactes, ne sont pas sans exiger des précautions. La science du calcul n'est rien autre chose qu'une suite de raisonnements pour ainsi dire emmagasinée, dont on ne conserve pas la trace, et qui mène à une conclusion fatale, étant donnés les chiffres primitifs du problème et la méthode du calcul. La rigueur de la conclusion dépend donc entièrement de la rigueur du raisonnement emmagasiné dans la méthode ou dans la marche adoptée. Combien de conclusions se sont trouvées fausses, dans des calculs compliqués, parce que l'on n'a pas tenu compte de cette circonstance !

Quand Leibnitz et Newton inventaient, indépendamment l'un de l'autre, le calcul différentiel, ils partaient de points de vue tout à fait différents. Leibnitz partait d'une base fausse en admettant l'existence réelle des infiniment petits ; Newton raisonnait plus juste en prenant pour point de départ les limites de déplacements très petits. Le procédé de Leibnitz, dans la plupart des cas suffisant, s'est trouvé en défaut dans des points délicats. La postérité, cependant, a adopté toute la nomenclature de Leibnitz, parce qu'elle fait image, mais en la contrôlant par les raisonnements rigoureux de la méthode des limites. Il y en a qui ont vu et voient encore du mystère dans le calcul différentiel et intégral. En réalité il n'y a là du mystérieux que pour ceux qui s'en tiennent au mode de procéder de Leibnitz, parce qu'il s'appuie sur un raisonnement philosophiquement faux ; mais les procédés démonstratifs employés maintenant rendent la marche du calcul aussi claire que les quatre premières règles de l'arithmétique. Il ne faut donc pas se laisser conduire à l'aveugle par le calcul, mais bien plutôt conduire soi-même son calcul, et en être à chaque instant suffisamment maître pour être bien sûr de ce qu'on lui donne au départ et de ce que l'on en retire à la fin.

Si l'on doit prendre des précautions dans l'emploi même du calcul, à plus forte raison faut-il être rigoureux quand il s'agit de la constatation des faits et des lois qui les régissent. C'est là surtout qu'il importe de ne pas s'appuyer sur un point de départ douteux ou mal défini.

Avant de généraliser la loi d'un phénomène, il faut être bien sûr que, dans tous les cas sans exception où il a pu être observé, le fait se passe réellement et invariablement de la même manière, en tenant compte sans doute des obstacles qu'il peut rencontrer et qui lui sont étrangers. C'est une condition indispensable pour que ce phénomène puisse servir de point de départ à une théorie scientifique, et pour que l'on ait droit d'exiger l'assentiment universel.

Prenons, par exemple, la théorie de Darwin. Si on la dégage des désirs insensés d'un certain nombre de ses adeptes qui voudraient arriver à se passer d'une cause première, la théorie de Darwin, réduite à la transformation lente des espèces et même au passage de la nature inorganique à la nature organisée, n'est pas déraisonable en soi, ni même antibiblique ; car il n'est pas contre la raison de croire que Dieu aurait pu donner à la nature

qu'il a créée une énergie suffisante pour lui faire produire ces résultats. Il semble même que la Bible favorise cette théorie lorsqu'elle nous rapporte, pour la production des animaux et des plantes, non pas que Dieu les fit de toutes pièces, mais qu'il dit :— "Que les eaux produisent les oiseaux et les reptiles ; que la terre produise les animaux et les plantes!" Et cependant je n'hésite pas à le dire, la théorie de Darwin n'est pas scientifique ; pourquoi ? parce qu'elle ne s'appuie pas sur les faits. Si quelques faits isolés de croisement entre espèces voisines ont pu donner quelque *espérance* aux partisans de Darwin, la constance des produits ainsi obtenus, jointe à leur impossibilité de se reproduire, est devenu une preuve de plus en faveur de la fixité des espèces, qui était d'ailleurs appuyée sur l'observation universelle.

De même pour le passage de la nature inanimée à la nature vivante, si les microbes infiniment petits, et dont la constatation a échappé pendant quelque temps aux moyens connus d'observation, ont pu entretenir les illusions des darwinistes, les immortels travaux de Pasteur et de Tyndall sont venus montrer que, lorsqu'on excluait tout être vivant, la physique et la chimie n'ont pu jusqu'à présent produire, je ne dis pas cet être complexe appelé microbe, mais même une seule cellule organisée. Le darwinisme, comme théorie, n'est donc pas scientifique ; c'est une pure hypothèse fantaisiste, qui peut tout au plus amuser ceux qui ont du temps à perdre, mais qui ne devrait pas occuper un homme sérieux.

Malheureusement ce sont des utopistes de cette sorte qui font tort à la vraie science, parce qu'ils en prennent les allures, et adoptent un langage d'autant plus affirmatif qu'ils sentent eux-mêmes que leurs points d'appui sont moins solides. Aussi ne manque-t-on pas de les invoquer quand on veut infirmer les résultats acquis de la science moderne.

Il est donc du devoir des partisans de la vraie science de ne rien affirmer que sur bonne preuve, de donner comme douteux ce qui n'est pas encore suffisamment appuyé, et aussi de combattre les théories qui ne sont que le produit d'une imagination plus ou moins ingénieuse.

Il serait cependant injuste de condamner les hypothèses par lesquelles les savants essayent de rendre compte de certains phénomènes compliqués, comme la gravitation, l'électricité, la lumière, la chaleur, l'affinité chimique, etc. D'abord ces hypothèses ne sont pas données comme explications absolues, mais simplement comme manière probable — en attendant mieux — de grouper les faits dépendant d'une même cause apparente. Puis elles sont tenues de rendre compte de tous les détails sous peine d'être rejetées. Mais, dans tous les cas, les lois qui régissent les phénomènes, et dont ces hypothèses doivent rendre compte, sont complètement indépendantes de ces dernières, et n'en seraient pas moins solides, quand même ces mêmes hypothèses seraient reconnues fausses et devraient être remplacées par d'autres plus heureuses. Il ne faut donc pas oublier que ce ne sont pas les hypothèses qui déterminent les lois, mais qu'au contraire ce sont les lois constatées qui servent de *criterium sine qua non* aux hypothèses.

Ainsi, que la gravitation soit le fait d'une attraction dont les corps matériels seraient les centres, ou qu'elle soit due à la pression de l'éther, ou à toute autre cause non encore imaginée ou découverte, peu importe : cela n'influera en rien sur *les lois* de la gravitation, qui resteront démontrées.

De même, les relations entre la force, la masse et la vitesse ont été l'objet de démonstrations si rigoureuses qu'on ne saurait, par exemple, prétendre "que le corps le plus

massif peut circuler autour d'un autre qui le serait moins, en vertu de leur gravitation mutuelle," qu'en laissant de côté *tous les faits connus* pour mettre à leur place des faits purement *imaginaires.* Comme c'est sur ces lois que repose la disposition actuellement admise de notre système solaire, il s'en suit qu'on ne saurait vouloir revenir aux conceptions des anciens, et faire, par exemple, circuler le soleil autour de la terre, qu'en substituant l'imagination aux faits les mieux observés.

En résumé, ceux qui s'occupent de sciences doivent être très prudents et très circonspects dans leurs affirmations, et ne donner comme certaines que les notions parfaitement et rigoureusement démontrées.

D'un autre côté, le public doit donner à la science, même moderne, le crédit de ses vraies découvertes ; et il n'a pas le droit, parce qu'il ne les comprend pas, de les nier par préjugé, ou même par respect pour les auteurs anciens, très vénérables d'ailleurs, mais qui n'étaient pas tenus de deviner ce qu'ils ne connaissaient pas.

Comme conclusion, il me semble qu'il est facile de faire un catalogue de ce qui est véritablement acquis et démontré dans les sciences d'observation, en l'appuyant des documents nécessaires, de telle sorte qu'il devienne suffisant de nier quelques-unes de ces vérités scientifiques pour faire rire de soi.

Celui qui fera ce livre rendra un service réel à la science, et épargnera une foule d'efforts inutiles à des gens bien intentionnés d'ailleurs, mais qui s'épuisent à redécouvrir ce qui est déjà démontré, ou à vouloir démolir des montagnes trop solides pour leurs impuissantes tentatives.

II.—*Automatic and Multiplex Telegraphy.*

By F. N. GISBORNE, C.E., M.I.E.E.

(Read May 27, 1891.)

In a former paper upon "The Inception of Electrical Science and the Evolution of Telegraphy" read in Section III of the Royal Society of Canada, and subsequently revised and published by the Canadian Society of Civil Engineers, the concluding paragraph read as follows:

"That the most successful and profitable telegraph companies of the future will abandon the present system of a multiplicity of wires for the transmission of intelligence, and at business centres and important stations, will employ female labour for perforating and comparing with the original manuscript despatches, to be forwarded by AUTOMATIC transmitters; an additional wire being operated by Morse sounders for the correction of errors, and also for the requirements of intermediate local business, such additional wire being available for duplex, quadruplex or MULTIPLEX instruments."

The foregoing conviction has been confirmed by late improvements both in automatic and multiplex apparatus, whereby telegraphy can now compete profitably with the postal systems in such long distance countries as Canada and the United States.

Twenty-five cents for a ten-word message, exclusive of address and signature, does not appear to be an excessive charge when the time saved is material, and when business men have learned by experience how much information can be conveyed within such limited number of words; but to the uninitiated general public 100 words at the same tariff rate would be a great boon, and add materially to the volume of both commercial and social inter-communication.

The practical means by which such desirable result can be accomplished with profit to investors may now be considered.

Thousands of miles of poles and wire at a primary cost of millions of dollars for construction and a vast outlay for maintenance and renewals can be dispensed with by the adoption of automatic and multiplex telegraphy. By the former 1,000 words per minute have been correctly transmitted, during stormy weather, between cities 1,000 miles apart; and by the latter one wire is utilized for a dozen distinct and parallel circuits.

A skilful Morse operator transmits during a day of eight or nine working hours an average of twenty-five words a minute, and by a Wheatstone automatic repeater 300 to 400 words can be sent over moderately long circuits; but the latter apparatus requires considerable auxiliary labour, as every dot and dash in each alphabetical letter has to be stamped out separately prior to transmission per wire.

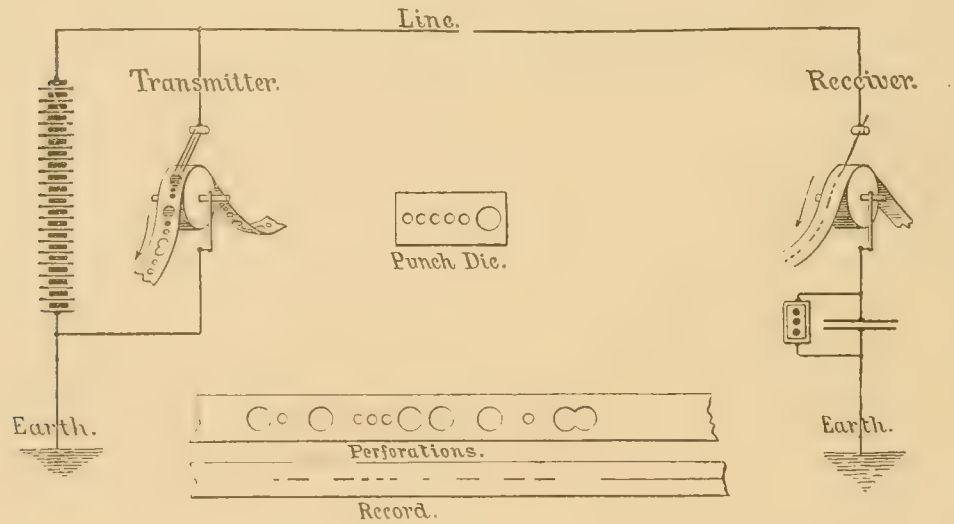
Duplex, quadruplex and multiplex instruments require separate skilled operators for each and every circuit utilized in such systems, so that the economy is limited to the reduced number of wires, etc., between stations.

Hitherto the speed of automatic transmission over long distance circuits has been limited by static induction in the line wire, causing dots and dashes to run into each other, and thus appear at the terminal station in a continuous line; but such difficulty has also been overcome.

Multiplex telegraphy, on the other hand, requires practically perfect synchronism between the instruments at both ends of the line, the elimination of static induction, and as many electrical impulses per second as will render it impossible for a skilled Morse operator to close his key without intercepting a current in connection with corresponding sections of subdivided dial plates, over which rapidly revolving arms are making synchronous contacts.

Hitherto multiplex telegraphy has been limited to direct connections between terminal stations; but this objection has also been provided for by the several inventions herein referred to.

F. Anderson's Automatic Machine Telegraph.



By the above system the Morse dot and dash code of signals is transmitted by means of perforations in a strip of paper, and received either by chemical decomposition or by ink registers.

The rapid preparation of accurate perforations is therefore of primary necessity.

In the Wheatstone automatic alternating or double current system each integral part of a character or letter is perforated separately, and such operation is therefore much slower and less accurate than if each letter was punched out by a single movement. Nineteen punch dies (including the feeding row) are required for such system.

By the Anderson single current system much simpler perforations, requiring but six dies, are necessary, the holes (*vide* diagram) representing the spaces between each dash or dot, and each complete letter of the alphabet being punched out by a single type-writing movement.

The transmitter is placed in a shunt from line to earth, the battery being normally connected to line.

The advantage of such arrangement in rapid signalling is that the line is connected to earth through a path of no appreciable resistance between each signal, the cessation of the signal and the grounding being simultaneous; thus the largest portion of static induction escapes at the transmitting end, leaving the minor portion to be contended with at the other terminus.

After passing through the recorder the current reaches the condenser and thence to earth, controlled in the usual manner by resistance coils.

The electric signal, after leaving its record upon the chemically prepared paper, enters and charges the condenser to a degree more or less approaching its own potential. When the signal impulse begins to weaken, the static charge near the receiving end tends to follow and prolong the record, but is met by the counter charge of the condenser, and is thus neutralized, the resistance in the condenser shunt being from four to six times greater than that of the line.

Herein is shown the further advantage of the perfect grounding of the line at the sending end by the more complete discharge of the condenser between each signal; for if the usual arrangement of transmission by direct open and close contact of line and battery be substituted, the condenser becomes so completely charged after two or three signals that no further record can be obtained unless the resistance in the shunt is so far reduced as to impair its clearness.

Hitherto automatic systems have worked best in wet weather, owing to the lessened static induction from leakage; but the new system works equally well in all weathers. It is also free from the necessity of continuous readjustments.

The record obtained is also remarkably well defined even at the reported speed of 3,000 words per minute over a copper wire of two ohms per mile resistance and 351 miles in length, experimentally utilized, between New York and Washington cities.

Again repeated work at 600 words per minute has been produced over a copper-wired line between New York and Chicago, 1,027 miles in length, as clearly as it would have been by direct transmission. (*Vide* Plate No. 1.)

The possibility of obtaining a multiplicity of signalling circuits in a given line wire by methods other than those comprised in quadruplex telegraphy is presented in the systems that have been devised to transfer the line wire from one set of instruments to another similar set successively at both ends of the circuit, and thus afford to each corresponding apparatus an intermittent connection so rapidly recurring as to be practically continuous. This is the principle of the established Delany system, whereby six circuits can be obtained on a single line wire.

It has, however, been found in practice that such number of circuits are limited to 100 mile distances, or four over 200 miles. Again the receiving apparatus is actuated by currents emanating from the transmitting end only, and thus rendering the system inapplicable for intermediate stations. Thirty-four current impulses per second = three impulses per dot signal, are also necessary for operating it at the ordinary maximum rate of transmission.

By the Keeley system signals are manifested by pulsations emanating from both terminal stations concurrently, such currents being of alternative polarity, occurring twenty-four times in a second, the position of each key in the circuit determining the polarity of the current passing through it.

The receiving apparatus comprises a polarized relay, with an induction coil so arranged that a single effect is produced by a given pulsation of current on the main circuit.

Twenty-four pulsations, alternating in polarity, per second, are ample for the fastest practical speed of manipulation.

The receiving apparatus is sufficiently sensitive to respond to currents of ·003=1/333 of a second's duration on a No. 8 iron wire 300 miles in length; thus (1/333÷1/24) rendering thirteen distinct circuits available for operation.

A reference to the diagram will explain how the important advantage is obtained of operating way stations without the necessity of equipping them with additional main batteries.

With the foregoing perfected apparatus at command, the cost and capabilities of the combined systems may now be considered.

A first class telegraph line, constructed with cedar poles 30 feet in length and 6 inches diameter at top, with cross-arm and oak pins 1½ inches diameter, improved porcelain insulators, one No. 4 hard drawn copper wire and one No. 6 galvanized iron wire, fully equipped with instruments, etc., would cost between $400 and $500 a mile, or say for a through main line between New York and Chicago, or from Quebec *via* Montreal, Ottawa and Toronto to the United States frontier 1,000 miles, $500,000 maximum.

Such class of line would remain in good working condition for over thirty years, and could be permanently maintained at an annual cost of not exceeding $15,000 per annum for repair and renewals.

The minimum capacity of transmission of intelligence during eight hours out of the twenty-four would exceed 50,000,000 words=500,000 messages of 100 words each per annum.

To conduct such amount of business the salaries of operators, perforators and copyists would not exceed $25,000 per annum; rentals, management and incidentals, $20,000; to which add maintenance and renewals, $15,000—in all $60,000 per annum maximum.

The revenue from 500,000 messages at 25 cents for 100 words, minus 3 cents for delivery, would be $110,000, plus press news income; thus the minimum net profit would be $50,000=10 per cent. upon the capital expended, and this upon an estimate of 500,000 messages per annum only, whereas the certainty is that they would exceed 1,000,000, and thus yield over 30 per cent. dividends.

The foregoing estimates are based upon the knowledge acquired after forty years' experience in practical telegraphy, and can be relied upon as substantially correct.

The only question remaining for consideration is the present and prospective amount of business available for the foregoing results.

Between New York and Chicago over 2,500,000 telegrams and 10,000,000 letters are now annually interchanged. At least one-eighth of the latter would, under a 25-cent tariff for 100 words, be transmitted by wire; thus any company conveying one-third of the telegraph and one-eighth of the postal business would have four times the estimated minimum number of 500,000 messages at immediate command.

Again, the dozen commercial through main wires between Quebec and the United States frontier, *via* Montreal, Ottawa and Toronto, convey 1,000,000 telegrams per annum, and the postal service over 6,000,000 letters; thus, with one-third of the telegraph and

one-eighth of the postal business at command, more than double the estimated number of 500,000 messages are immediately available.

The argument thus confirms the correctness of the quotation at the commencement of this paper, namely, "That the most successful telegraph companies of the future will abandon the present system of a multiplicity of wires in favour of automatic and multiplex apparatus."

III.—*On the Density of Weak Aqueous Solutions of Nickel Sulphate.*

By Professor J. G. MACGREGOR, D.Sc., Dalhousie College, Halifax, N. S.

(Read May 29, 1891.)

In a paper which I had the honour of reading before the Royal Society of Canada last year[1] I gave the results of observations of the density of dilute solutions of various sulphates in water, made with the object of determining how many of them form solutions having a smaller bulk than their constituent water would have in the free state. Among those which were found to do so was nickel sulphate, and by means of a single observation made by Dr. W. W. J. Nicol[2] and two on somewhat strong solutions made by Favre and Valson,[3] I formed a rough estimate of the limit of concentration within which such solutions were formed, and of the magnitude of the contraction in the case of the one which exhibited it to the greatest extent. The estimate was necessarily rough, however, because (1) the number of available observations was small; (2) they were made by different observers, at different temperatures, with different samples of salt; and (3) only two of them were within the limit of concentration referred to. It has, therefore, seemed to me to be desirable that a few observations should be made on dilute solutions of this salt, that the magnitude of their contraction might be accurately determined and compared with that of solutions of the closely allied salt, cobalt sulphate.

Mr. A. M. Morrison, B.A., has accordingly made for me determinations of the density and percentage composition of three dilute solutions of nickel sulphate. These were found to agree so well with Favre and Valson's similar observations for less dilute solutions, that more were not necessary. Mr. Morrison's method and instruments were the same as those described in the paper referred to above, and the same precautions were taken to eliminate errors, as are therein described in detail. His results, along with those of Nicol and Favre and Valson, are given in the following table. The first three columns of the table contain experimental values from which the last three are calculated. The headings of the columns do not require explanation, except, perhaps, that of the sixth, with regard to which it may be stated that the quantities headed "Expansion" are the excesses of the quantities in the fourth column over those in the fifth, and therefore are the amounts by which the volumes of one gramme of the solutions, at the temperatures of observation, exceed the volumes which the water they contain would have in the free state at the same temperature.

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[1] 'Trans. Roy. Soc. Canada,' vol. viii (1890), Sec. iii, p. 19.

[2] 'Phil. Mag.,' ser. 5, vol. xvi (1883), p. 122.

[3] 'Comp. Rend.,' t. lxxix (1874), p. 968.

Percentage of anhydrous salt in solution.	Density at t ° (grms. per cu. cm.)	Temperature (t °)	Volume of 1 grm. of solution at t °. (cu. cm.)	Volume at t ° of water in 1 grm. of solution. (cu. cm.)	Expansion (cu. cm.)	Observer.
12·068	1·1332	23°·5 C.	0·88248	0·88152	+0·00096	Favre and Valson.
6·777	1·0703	23°·5 C.	0·93430	0·93456	—0·00026	"
3·9711	1·04116	20° C.	0·96047	0·96195	—0·00148	Nicol.
3·9633	1·04064	20° C.	0·96095	0·96203	—0·00108	Morrison.
2·0799	1·02046	20° C.	0·97995	0·98081	—0·00086	"
1·2512	1·01155	20° C.	0·98858	0·98920	—0·00062	"

If Mr. Morrison's observations be plotted so as to form a curve of densities *versus* concentrations, the points by which they are indicated will be found to lie practically on a straight line, passing through the point for which the concentration is zero and density 0·99827, this being the density of water at 20° C., according to Volkmann.[1] Such curves rarely continue to be straight (to the fourth decimal of the density in grammes per cubic centimetre) at higher concentrations than that of Mr. Morrison's most dense solution.[2] Favre and Valson's observations show that nickel sulphate is not peculiar in this respect. The points given by them (approximate allowance being made for the slight difference in the temperature of the experiments) are found to lie on a curve continuous with Mr. Morrison's and bending gently towards the axis of densities. The point given by Nicol's observation does not lie quite so well on the curve as the others; but it is not far off; and the close agreement of the other five observations would seem to warrant our using them to determine the amounts of the contraction exhibited by dilute solutions of various strengths.

If, therefore, we plot a curve of "expansions" *versus* concentrations, we may read off from it the expansions corresponding to different degrees of concentration. These are given in the following table:

Percentage of anhydrous salt in solution.	Expansion (cu. cm.)
1	—0·00049
2	085
3	105
3·5	110
4	105
5	092
6	061
7	018
7·35	000

[1] 'Wied Ann.,' Bd. xiv (1881), p. 260.

[2] See my paper, 'Trans. Roy. Soc. Canada,' vol. vii (1889), Section iii, p. 23.

Thus the limit of concentration within which solutions of this salt have volumes smaller than those of their constituent water is about 7·35 per cent. The solution which exhibits the greatest contraction is one containing 3·5 per cent. of anhydrous salt, and the amount by which the volume at 20° of one gramme of this solution is less than that of its constituent water is 0·0011 cu. cm.

With regard to the relation of the above results to similar results obtained in the case of cobalt sulphate, and published in the paper referred to above, it may be noted that the concentration-density curves of the two salts are almost coincident up to a concentration of about 4 per cent. They may be represented very approximately by the formula:

$$D_{20}=0{\cdot}99827+0{\cdot}01064p$$

where D_{20} stands for density at 20° C. and p for percentage of anhydrous salt in solution. They are not quite coincident, however, and the amounts of the contraction in dilute solutions of the cobalt salt differ somewhat from those of the nickel salt. In the case of the former the limit of concentration within which the solutions have smaller volumes than their constituent water is, as shewn in the paper cited above, about 5·5 per cent.; the solution exhibiting the greatest contraction is one of about 2·8 per cent., and the amount by which the volume at 20° C. of one gramme of this solution is less than the volume of its constituent water is 0·00064 cu. cm.

IV.—*Nomenclature in Time-reckoning.* — (1) *The Unit of Time ;* (2) *The Hour Meridians ;* (3) *Notation of the Hours.*

By SANDFORD FLEMING, C.M.G., M.Inst.C.E., F.G.S., LL.D., etc.

(Read May 27, 1891.)

(1) THE UNIT OF TIME.

At the meeting of last year I had the honour to bring to the attention of the society the question of nomenclature in the matter of the reform in reckoning time, and the subject was referred for consideration to a special committee. On the report of the committee being made to the section, it was submitted to a general meeting, and the society resolved that the attention of sister societies and scientists in other parts of the world should be directed to the subject.

In compliance with the resolution passed at the general meeting, the council opened correspondence with societies and men of learning towards obtaining a designation for the unit measure of time, with the hope that some term might be found to meet general acceptance.

As a result the following compound words have been proposed :

1. Chronocanon (the time standard).
2. Chronomonad (the time unit).
3. Cosmochron (the world time).
4. Cosmognome (the world dial or style).
5. Heliomonad (the sun unit).
6. Metremer (the measuring day).
7. Metrochron (the measuring time).
8. Monochron (the unit of time).
9. Nomochron (the law or standard of time).
10. Pantochron (universal time).

There has been a general desire evinced for a short word, even if it contains but one verbal element of the idea to be expressed. It has been submitted that a word of this character, properly selected, would more speedily obtain general acceptance as signifying the time-measure or unit common to the world. Two words, "Heliod" and "Chron," have been suggested. The first, derived from *helios* (the sun), is by some held to be sufficiently self-interpreting, and not farther removed from classical usage than many other

scientific terms derived from Greek. It has, besides, a mythical and metaphorical propriety, as Heliads (Heliades), in ancient mythology, were children of the Sun, and the time-measure may also metaphorically be reckoned a child of the sun.

The second word "Chrone," or preferably "Chron," is advocated by the greatest number of correspondents. It enters into the composition of seven of the ten compound words above presented, and it is the chief verbal element in nearly all words respecting time now in common use; the following for example:

1. Anachronism—an error in point of time.
2. Chronicle—a narrative in the order of time.
3. Chronic—continuing a long time.
4. Chronogram—a writing including the date of an event.
5. Chronograph—an instrument for denoting small intervals of time—a stop-watch.
6. Chronometer—an instrument for measuring time.
7. Chronology—the science which treats of dates in the order of time.
8. Chronometry—the art of measuring time.
9. Isochronous—occurring in equal time.
10. Metachronism—Placing an event after the real time of its occurrence.
11. Parachronism—an error in chronology by which an event is placed later than it should be.
12. Prochronism—dating an event in advance of the time it happened.
13. Synchronal—occurring at the same time.

There is a general consensus of opinion among those who have been heard from that the designation we are in search of should in some form embrace the verbal element *chron*, from the circumstance that it is a component part of the larger number of words relating to time. The compound words *cosmochron* (the world time) and *nomochron* (the law or standard of time) have been submitted as worthy of consideration, and in the breadth of their meaning neither of these words can be held to be inappropriate. There may be a preference, however, for the simple monosyllable, and in this case the word *chron*, although somewhat wanting in euphony, has much to recommend its acceptance.

(2) The Hour Meridians.

The hour zone system being designed to bring the reckoning of time throughout the world into direct relationship with a common standard—the unit measure—it is important that the hour meridians by which all local reckonings are intended to be regulated should receive terms by which they will be known and everywhere easily distinguished.

Starting from the anti-prime meridian, which, in conjunction with the solar passage, is the established zero of time, the hour meridians are fifteen degrees of longitude apart, and, including the zero meridian, number twenty-four. On this continent and in Europe they have in some instances been assigned terms which, while acceptable in a limited

geographical extent, cannot be recognized as wholly satisfactory when considered in relation to both hemispheres. Take, for example, the hour meridian which finds its place at 75° west longitude; it has tentatively received the name "Eastern," from the fact that this meridian passes near the eastern coast of the United States. It will be obvious, however, that south of the equator this term is inadmissible, inasmuch as the same meridian follows approximately the western coast of South America Again, the meridian 105° west has been termed the "Mountain" meridian, for the reason that it traverses the Rocky Mountains where they occur in the United States; but the same meridian, followed north, passes through the heart of the great prairie region of Canada, unmarked by the presence of mountains, and followed south beyond the American coast this hour meridian meets no land whatever; it passes over only the Pacific Ocean to the antartic circle.

In Europe the name "Adria" has been attached to the hour meridian of 15° east longitude, presumably owing to the fact that it intersects the Adriatic Sea. This designation may be held to be acceptable in Europe, but it must be considered as less appropriate in the southern hemisphere.

There is a restricted meaning to nearly all local and geographical terms, and it is submitted by the writer, with all respect for the opinion of others, that a nomenclature based on such terms is unattainable, if the object be to obviate confusion and give satisfaction in future years in all quarters of the globe. It may be added, moreover, that the difficulty is greatly increased by reason of the diversity of language among the nations.

The same objections do not apply to numbers. A nomenclature based on numbers would be common to all nations; it would have the one meaning in all languages, and would be equally appropriate in all latitudes.

The twenty-four hour meridians take their origin from the recognized zero of time, which is diurnally determined by the solar passage on the anti-prime meridian; it is therefore natural that if they are to be known by numbers, the series of numbers should begin at the anti-prime meridian as zero. The point of commencement being settled, there remains to be considered the direction the series of numbers should take—that is to say, whether the hour meridian should be counted east or west from the anti-prime meridian.

If we commence to observe the passage of time at the instant of zero, in the lapse of an hour the earth will have revolved on its axis fifteen degrees and brought the first hour meridian west of the anti-prime meridian under the sun. What more appropriate designation for this hour meridian than *number one* (unus)? At the end of the second hour the earth will have revolved another fifteen degrees and brought under the sun the second hour meridian west of zero; with equal propriety this may be termed hour meridian *number two* (duo). Similarly, the third, fourth and every one of the twenty-four hour meridians may be numbered in consecutive order.

This simple and natural mode of distinguishing the hour meridians will be found to have advantages peculiar to itself. Referring to the accompanying projection of the northern hemisphere, the figures around the circumference indicate the hour meridians numbered on this principle. These figures likewise indicate the twenty-four hours into

which the world's standard unit measure of time is divided. The motion of the earth on its axis brings each hour meridian in succession to its solar passage, and by numbering them as described a complete coincidence is obtained between the hour meridians and

the hours of the world's standard. For example, when the solar passage reaches hour meridian number twelve it will be 12 o'clock, when it arrives at hour meridian number seventeen it will be 17 o'clock, and so on for every meridian. Thus we realize the conception that the earth itself is the great standard chronometer, while the sun is the index to point out the hours.

This nomenclature by numbers generally assented to, the hour meridians which constitute the sub-standards for universal time-reckoning would be distinguished as follows:

Anti-Prime Meridian 180° east and west from Prime Meridian, "Zero."
Hour Meridian 165° East longitude, number one..... No. 1, "Unus."
" 150° " " two ..... " 2. "Duo."

Hour Meridian	135°	East longitude,	number	three	No. 3,	"Tres."
"	120°	"	"	four	" 4,	"Quatuor."
"	105°	"	"	five	" 5,	"Quinque."
"	90°	"	"	six	" 6,	"Sex."
"	75°	"	"	seven.....	" 7,	"Septem."
"	60°	"	"	eight	" 8,	"Octo."
"	45°	"	"	nine.....	" 9,	"Novem."
"	30°	"	"	ten	" 10,	"Decem."
"	15°	"	"	eleven	" 11,	"Undecim."
"	0°	Prime Meridian	number	twelve	" 12,	"Duodecim."
"	15°	West Longitude,	number	thirteen.....	" 13,	"Tredecim."
"	30°	"	"	fourteen	" 14,	"Quatuordecim."
"	45°	"	"	fifteen	" 15,	"Quindecim."
"	60°	"	"	sixteen	" 16,	"Sedecim."
"	75°	"	"	seventeen	" 17,	"Septendecim."
"	90°	"	"	eighteen	" [1]18,	"Octodecim."
"	105°	"	"	nineteen	" [1]19,	"Novendecim."
"	120°	"	"	twenty	" 20,	"Viginti."
"	135°	"	"	twenty-one.....	" 21,	"Viginti unus."
"	150°	"	"	twenty-two ...	" 22,	"Viginti duo."
"	150°	"	"	twenty-three ..	" 23,	"Viginti tres."

Anti-Prime Meridian 180° East and West longitude, number twenty-four and Zero.

[1] Since this paper was submitted at the meeting of the Royal Society, in May, the following has been suggested as another method of carrying out the same principle.

Hour Meridians numbered from the Anti-Prime Meridian, 180° *east and west from Greenwich.*

Hour Meridian.	Meridiana Horarŭm.	Longitude, East and West of Prime Meridian.
Anti-Prime Meridian—Zero ..	Meridianum Normale	180° E. and W.
First Hour Meridian.....	" Primum	165° E.
Second "	" Secundum	150° E.
Third "	" Tertium	135° E.
Fourth "	" Quartum	120° E.
Fifth "	" Quintum	105° E.
Sixth "	" Sextum	90° E.
Seventh "	" Septimum	75° E.
Eighth "	" Octavum.....	60° E.
Ninth "	" Nonum	45° E.
Tenth "	" Decimum	30° E.
Eleventh "	" Undecimum.....	15° E.
Twelfth "	" Duodecimum	0°
Thirteenth "	" Decimum tertium	15° W.
Fourteenth "	" Decimum quartum.....	30° W.
Fifteenth "	" Decimum quintum.....	45° W.
Sixteenth "	" Decimum sextum	60° W.
Seventeenth "	" Decimum septimum ...	75° W.
Eighteenth "	" Decimum octavum.....	90° W.
Nineteenth "	" Decimum nonum.....	105° W.
Twentieth "	" Vicesimum	120° W.
Twenty-first "	" Vicesimum primum....	135° W.
Twenty-second "	" Vicesimum secundum..	150° W.
Twenty-third "	" Vicesimum tertium....	165° W.
Twenty-fourth and Zero.....	Meridianum Normale	180° E. and W.

By thus numbering the hour meridian we establish a direct relationship between the reckoning in each zone or section, and the world's standard. This relationship may for convenience be reduced to the following formula:

Let H. be the number of the hour meridian and W. S. the world's standard, then

(1) In the zone of hour meridian number 12 (duodecim) (corresponding with the meridian of Greenwich) the notation of the hours will agree with W. S.

(2) In all EAST longitudes (zones to the east of hour meridian 12) the notation will be in advance of W. S.; the number of hours FASTER than W. S. will in each case equal 12 *minus* H.

(3) In all WEST longitudes (zones to the west of hour meridian 12) the notation will be behind W. S.; the number of hours SLOWER than W. S. will in each case equal H. *minus* 12.

By this principle of nomenclature the distinguishing number of each hour meridian will be the key to the notation in the zone of that meridian; it will likewise denote the precise relation which each zone reckoning bears to the world's standard. The accompanying table will make this clear.

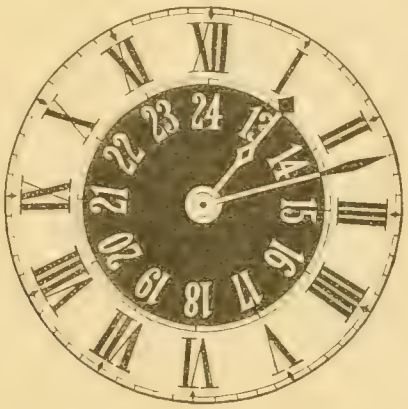
Table showing the relationship between Zone-Reckoning and the World's Standard.

Hour Meridian	No.	1,	East Longitude,	by formula (2),	12— 1=	Zone-reckoning	11 hours faster.
"	"	2,	"	"	12— 2=	"	10 hours faster.
"	"	3,	"	"	12— 3=	"	9 hours faster.
"	"	4,	"	"	12— 4=	"	8 hours faster.
"	"	5,	"	"	12— 5=	"	7 hours faster.
"	"	6,	"	"	12— 6=	"	6 hours faster.
"	"	7,	"	"	12— 7=	"	5 hours faster.
"	"	8,	"	"	12— 8=	"	4 hours faster.
"	"	9,	"	"	12— 9=	"	2 hours faster.
"	"	10,	"	"	12—10=	"	3 hour faster.
"	"	11,	"	"	12—11=	Zone-reckoning	1 hour faster.
"	"	12,	Prime Meridian by formula (1), reckoning identical with the World's Standard.				
"	"	13,	West Longitude,	by formula (3),	13—12=	Zone-reckoning	1 hour slower.
"	"	14,	"	"	14—12=	"	2 hours slower.
"	"	15,	"	"	15—12=	"	3 hours slower.
"	"	16,	"	"	16—12=	"	4 hours slower.
"	"	17,	"	"	17—12=	"	5 hours slower.
"	"	18,	"	"	18—12=	"	6 hours slower.
"	"	19,	"	"	19—12=	"	7 hours slower.
"	"	20,	"	"	20—12=	"	8 hours slower.
"	"	21,	"	"	21—12=	"	9 hours slower.
"	"	22,	"	"	22—12=	"	10 hours slower.
"	"	23,	"	"	23—12=	"	11 hours slower.

(3) Notation of the Hours.

In the interest of railway administration and in order to promote public safety and general conveniences, a desire has been evinced to follow the recommendation of the

Washington International Conference of 1884, with respect to the nomenclature of the twenty-four divisions of the standard time-unit. The proposal to number the hours in a single series from mid-night to mid-night is favoured by many persons. The change has indeed been introduced for some years on the Canadian Pacific Railway and the Intercolonial Railway. The new notation has been brought into use throughout the Indian Empire, and it has likewise been recommended by the British Government to the favourable consideration of the authorities of all the British Colonies. But for a supposed interference with existing clocks and watches, the simple nomenclature known as the "twenty-four hour notation" would more speedily be brought into use generally. Experience has established that the difficulty is non-existent, inasmuch as ordinary time-pieces can readily be adapted to the new notation by inscribing on their dials the afternoon hours in some such manner as the diagram indicates. It will be obvious that hours having a lower



number than twelve belong absolutely to the first part of the day; those having a higher number to the after part. By this expedient the introduction of the twenty-four hour notation in any part of the world involves no change in time-pieces beyond the simple inscription on their dials of the new numbers of the afternoon hours.

V.—*On the Variation with Temperature and Concentration of the Absorption Spectra of Aqueous Solutions of Salts.*

By Prof. J. G. MACGREGOR, D.Sc., Dalhousie College, Halifax, N. S.

(Read May 29, 1891.)

The study of any property of a solution which is possessed only to a slight extent, or not at all, by the solvent, is likely to throw light upon the constitution of the solution ; and for this reason (the electrical conductivity of water being practically zero and that of solutions of salts and acids finite and measurable) the study of electrolysis has thrown much light upon the relation of water to the substance dissolved in it, and upon the many physical and chemical phenomena which depend upon this relation. The selective absorption of light is another property which many solutions possess in a very high degree, but which water possesses hardly at all. For though water has indeed a distinct absorption spectrum, relatively to many solutions of coloured salts its selective absorption may be said to be exceedingly small. It might be expected, therefore, that the study of the absorption spectra of aqueous solutions would also throw light on their constitution, though, for obvious reasons, not to such an extent as in the case of electrolysis. Nevertheless this field has been but slightly cultivated, and very little is known as to the dependence of the absorption spectra of solutions upon their concentration, temperature or other physical property.

My attention has been drawn to this field as a fruitful one for investigation, in following out the working hypotheses which I usually employ in thinking of problems in solution. Though the hypotheses are crude, and would require to be made much more precise before they could become the fundamental assumptions of a theory of solution, they may be stated here.

The molecular theory of the constitution of material bodies being assumed, the fact that a drop of water can hold together in opposition to the attraction of the earth, seems to imply the action of attractive forces between its molecules. The same may be said of the molecules of a crystal of salt. Also the fact that a crystal of salt, which at ordinary temperatures will remain for any length of time surrounded by air without changing in mass, and which therefore undergoes sublimation to no appreciable extent, will, when surrounded by water, diminish rapidly in mass, seems to imply the action of attractive forces between the water molecules and the salt molecules. If these attractive forces be assumed, a relation between their magnitudes is suggested by two other facts. The first, that in the solution of a salt crystal the water molecules are able to carry off the salt molecules in opposition to the attracting forces of the other salt molecules of the crystal, suggests the assumption that, other things being equal, the attraction between salt and water molecules is greater than that between salt molecules themselves. The second fact, that almost all salt particles at some temperature carry water with them out of a solu-

tion on crystallizing, seems to imply that the attraction between salt and water molecules is greater than that between water molecules themselves. Finally, that the molecular attractions must be assumed to diminish rapidly with the distance between the attracting molecules, is obvious from the fact that the molecules must be brought very close together before the phenomena occur which suggest the assumption of the attractions between them; while once they are brought into sufficiently close contiguity the resulting phenomena are such that, if mutual attractions be assumed to account for them, they must be assumed to be great.

An aqueous saline solution, according to the molecular theory of the constitution of liquids, consists of a mixture of molecules of water and salt, all being in motion, but having free paths which are comparatively short. According to the kinetic theory of heat the mean velocity of the molecules determines the temperature, the temperature rising as the mean velocity increases. According to the above additional hypotheses, the various molecules attract one another, the attractions between unlike molecules being greater than those between like molecules, at equal distances, and all diminishing rapidly as the distance between the attracting molecules increases.

From this conception of a solution we may deduce its properties with more or less exactness. I have found it useful in coördinating such phenomena as the contraction of solutions, the solubility of salts, saturation and supersaturation, the lowering of the vapour tension and the freezing point, the relation of the "osmotic pressure" to the specific volume of the dissolved salt and the temperature of the solution, etc. In this paper, however, I wish to deduce from it merely the relative effects of elevation of temperature and of increase of concentration on the selective absorption of light, and to test the conclusion reached.

Let us think first of a dilute solution of a salt so constituted that its molecules will not undergo dissociation. In such a solution the salt molecules will not move among the water molecules independently, but will form small groups or systems, each consisting of a salt molecule and of more or fewer of the more slowly moving of the neighbouring water molecules, which, under the strong attraction of the salt molecule, will be kept revolving round it. The water molecules of such a system may occasionally, or indeed frequently, be carried beyond the sphere of the practical influence of the salt molecule by the "perturbations" of neighbouring molecules; but if so, other water molecules will quickly take their places from outside. The attractive forces involved diminishing rapidly with the distance, the sphere surrounding the salt molecule, within which the water molecules will be kept revolving round it, must be small, so that, although even a single salt molecule placed in a body of water must make its influence felt throughout the whole volume (so far, for example, as contraction is concerned), it will be able to include in its own system, and to carry with it as it moves, only a limited number of the surrounding water molecules. What the magnitude of the sphere will be, and what the number of water molecules which on the average it will enclose, will, for a given salt, depend upon the mean velocity of the particles of the system, *i.e.*, upon the temperature. But at a definite temperature, in a given solution, there will be on the average a definite number of water molecules revolving about each salt molecule and following it in its motion through the water. Such a system may be appropriately called a hydrate of the salt, though it does not coincide with the chemical conception of the hydrate as I understand that conception. To distinguish it therefrom we may call it a physical hydrate.

We have now to ask how these hydrates will be affected by elevation of the temperature of the solution. And, first, in the case of solutions of moderate strength, clearly elevation of temperature, meaning increase of the mean velocity of the molecules, will involve a diminution in the number of the water molecules in the system of any salt particle. For the outer water particles of any system, which the central salt particle is just able to keep within its sphere, will by an increment of their velocity be enabled to escape. Moreover, as increase of the velocities of the particles of the system will involve an increase in the perturbing opportunities of neighbouring molecules, there will be a more frequent interchange of water molecules between any system and the surrounding solvent. These will be the main effects of elevation of temperature; and they will be produced at all temperatures up to that at which the salt molecule is no longer able to keep any water molecules revolving round it.

The immediate effect of increase of concentration will be the bringing of the hydrate systems into closer proximity. It follows that, in the case under consideration, the resultant force exerted on a water molecule of any system, by the solution external to that system, will be increased, and therefore the resultant force on it towards the central salt molecule of its system, will be diminished. Hence the outer molecules of a system, which the central salt molecule was just able to keep within the system, will be enabled to escape; and consequently the number of water molecules in the hydrate will on the average be diminished. Also any hydrate system coming more frequently, in these circumstances, into proximity to other systems, than when there is more water or less salt present, will have its outer water particles more frequently wrested from it by perturbation, with the result of a more frequent interchange of water molecules, between it and the surrounding water.

Thus, in the main, the effect produced on the hydrate systems of solutions of moderate strength by elevation of temperature will be the same as that produced by increase of concentration.

Secondly, in the case of very dilute solutions, elevation of temperature will obviously produce an effect of the same kind as in solutions of moderate strength. Increase of concentration, however, will not. For the resultant force exerted on a water molecule of any system, by the solution external to that system, will not, when the systems are very far apart, be appreciably increased by increase of concentration. And thus increase of concentration may be expected to produce on the hydrates of very dilute solutions no appreciable effect whatever.

Thirdly, in the case of very strong solutions, so strong that the hydrate systems themselves form the great bulk of the solution and are thus brought into such close contiguity that they interfere with one another, forming, possibly, complex hydrate systems containing each two or more molecules of salt, the effect of elevation of temperature will be to increase the amount of free water in the solution and thus to diminish the interference of the systems, whereas the effect of increase of concentration will be to diminish the amount of such free water, and consequently to increase the interference of the hydrate systems. And hence in very strong solutions elevation of temperature and increase of concentration will produce different effects on the hydrates they contain.

So far we have been dealing with salts supposed to be incapable, in the circumstances, of undergoing dissociation. It is obvious, however, that as each salt molecule is to be

regarded as a system of atoms or atomic groups, bound together by finite forces and moving relatively to one another, it may occasionally, or indeed frequently, happen that the perturbations of surrounding water or salt molecules may be sufficient to separate the atoms or atomic groups, *i. e.*, to dissociate the molecules. We must now ask, therefore, how elevation of temperature and increase of concentration will affect the relative numbers of dissociated and undissociated molecules in a solution.

The elevation of the temperature of a given solution, involving increase of the velocity of all its constituent parts, will obviously both facilitate the dissociation of the salt molecules and impede the recombination of those constituents of the dissociated molecules which happen to meet. A larger number of salt molecules per second will undergo dissociation at the high temperature, and a smaller proportion of the meetings which may occur of the constituents of dissociated molecules will result in recombination. The frequency of these meetings, however, may be increased. For although the general expansion of the solution increases the distances which must be traversed by the constituents of the dissociated molecules before meeting with congenial partners, the increased number of dissociated molecules in the solution will diminish those distances, while the diffusion of the molecules will go on more rapidly at the high than at the low temperature. Elevation of temperature will, therefore, in two respects tend to increase the number of dissociated molecules in a solution, while in one respect it may tend to diminish the number. These opposing tendencies cannot be estimated quantitatively. But the two which make for increase of dissociation would seem to be more important than the one against it; and we may therefore conclude that in general elevation of temperature will result in increased dissociation. In certain cases, however, the balance of opposing tendencies may be on the other side, and elevation of temperature may result in diminished dissociation. And these remarks apply obviously both to dilute and to strong solutions.

What the effect of increase of concentration will be is not so easy to determine directly. But it may be learned hypothetically through the medium of experiment. For there are various properties of saline solutions, such as the differences in the values of the electrical conductivity and of the "molecular lowering" of the vapour tension and the freezing point, both in solutions of different salts and in solutions of different strengths of the same salt, which may be coördinated in a beautifully consistent manner, as has been shown by Arrhenius, Van 't Hoff, Ostwald and others, if it be assumed that these differences depend upon differences in the degree of dissociation of the salts in solution; and the very considerable degree of dissociation requisite on this assumption to produce the differences referred to may then be determined. As it has been found that the degrees of dissociation determined for any given solution by studying the various properties referred to, are the same, the hypothesis has established for itself a certain probability. And we may therefore accept the deduction which has been made from it as to the influence of increase of concentration on the state of dissociation of the salt in a solution, viz., that it diminishes the ratio of the number of dissociated molecules to the total number of molecules in solution, as probably correct.

If, therefore, the dissolved salt in a solution be partially dissociated, elevation of temperature and increase of concentration will in general produce opposite changes in its degree of dissociation.

The assumption of a comparatively high degree of dissociation in salt solutions is

made to account for their large molecular depression of the freezing point and vapour tension as well as for other properties; and for this purpose each of the molecules into which a salt molecule dissociates is assumed to lower the freezing point or vapour tension to the same extent as the undissociated salt molecule. This leads us to assume that the dissociated molecules exert attractions on the molecules of the solvent in the same way as the undissociated molecules. And it follows as above that the dissociated molecules also will form hydrate systems, and that the effects of elevation of temperature and increase of concentration on them will be related to one another as in the case of the hydrate systems of the salt molecules.

As water has practically no selective absorption, at any rate for light of a very great range of wave-lengths, the absorption of a solution throughout that range will, according to the above hypotheses, depend wholly upon the hydrate systems formed either by the salt molecules or by the products of their dissociation.

If, therefore, there be no dissociation, or so little that it may be neglected, elevation of temperature and increase of concentration must produce in the main the same effect on the absorption of solutions of any salt which are of moderate strength. They may be expected to produce opposite effects in very strong solutions. And in very dilute solutions increase of concentration may be expected to produce no appreciable effect.

If, however, there be dissociation, the absorption spectrum of a solution must be made up of absorption lines or bands due to the hydrate systems of the salt molecules and of others due to those of the dissociated molecules. If elevation of temperature and increase of concentration did not change the relative number of dissociated and undissociated molecules present in the solution, they would clearly produce on the total absorption of the solution effects related to one another in the same way as they would be if there were no dissociation. But as elevation of temperature involves, in general, increase in the degree of dissociation, and therefore diminution in the intensity of the absorption lines due to the systems of the salt molecules, and increase in the intensity of the absorption lines due to the dissociated molecules; and as increase of concentration involves a diminution in the degree of dissociation, and therefore an exactly opposite change of relative intensity, it follows that the changes produced in the absorption by elevation of temperature and increase of concentration may be expected to differ from one another to a greater extent if the salt molecules really undergo dissociation, than if they do not. It will be noted, however, that the direct effect on the hydrates of raising the temperature or increasing the concentration of the solution, is felt by all the hydrates in the solution and modifies the absorption of all, while the effect of these changes on the degree of dissociation modifies the absorption of a comparatively small number. Hence we may expect that in general the changes produced in the absorption of solutions of salts which undergo dissociation, by variations of temperature and concentration, especially if these variations be small, will be related to one another in the same way as if there were no dissociated molecules in the solution.

As elevation of temperature is well known to change the absorption of a solution, the above conclusions are clearly inconsistent with Beer's law of absorption, which states that two absorbing strata of solutions of the same salt will have the same absorption,

provided the concentrations of the solutions are inversely as the thicknesses of the strata; for according to this law absorption does not vary with concentration alone. But the variation with temperature is small. And Beer's law, though confirmed as practically accurate by the experimental investigations of many eminent observers, may not be rigorously accurate. The above conclusions may therefore be borne out by the small variations of absorption with concentration, which, though not of sufficient magnitude to have been hitherto of importance in the applications which have been made of Beer's law, as, *e. g.*, to quantitative spectrum analysis, may nevertheless be real.

The experience of those who have worked in the department of quantitative spectrum analysis would seem to indicate that its methods are becoming so accurate that the merely approximate character of laws hitherto assumed to be exactly applicable must be taken into account. Thus G. and H. Krüss[1] point out that the "absorption ratio" of a solution for light of a given wave length must no longer be assumed to be independent of the concentration. The absorption ratio is the quotient of the extinction-coefficient of a solution by its concentration. The extinction-coefficient is the reciprocal of the thickness which the absorbing solution must have in order that the transmitted light may have its intensity diminished to one-tenth of that of the incident light. It is calculated from the observed absorption of any convenient thickness of the solution by the application of Lambert's law of the relation of the absorption to the thickness of transparent bodies. It follows from the definition of the extinction-coefficient that, if both Lambert's and Beer's laws hold, the absorption ratio must be independent of the concentration. That it is not, shows that one or other or both, must be merely approximately true. It would be difficult to say which law is best supported by experimental evidence. But as the former assumes only that a given stratum of a given solution absorbs the same fraction of the light of given wave length which passes through it, whatever be the intensity of the incident light, and as the latter involves the assumption that the absorption of light by a solution is not affected by the action between the salt molecules and those of the solvent, it would seem to be probably the approximate character of the latter to which the variability of the absorption ratio with concentration is due.

So far as I am aware no systematic observations have been made to determine the relation between the effects of elevation of temperature and increase of concentration on the absorption of light. I have myself been able to make so far only rough qualitative observations, which, though they are in accordance with the conclusions reached above, are not worth publishing. A few isolated observations of a quantitative kind, however, have been made, which, though made for other purposes and by different experimenters, may, when combined, serve to test the above conclusions in a more or less rigorous manner.

Russell[2] has examined the absorption spectra of aqueous solutions of cobalt chloride and cobalt bromide at different concentrations and temperatures. He found that if, to a solution of the chloride ($CoCl_2$), formed by adding 4·18 grm. of the salt to 10 ccm. of water at 0° C., water be added in various quantities up to 16 ccm., the dilute solutions thus formed may be made to give the same absorption spectrum as the original solution

[1] G. and H. Krüss: 'Kolorimetrie,' Hamburg (1891), p. 146.

[2] 'Chem. News,' vol. li (1885), p. 259; 'Beiblätter Wied. Ann.,' Bd. x (1886), p. 570.

at 0° C., by a proper elevation of temperature. The following are his published numbers:

Amount of water added.	Requisite Temperature.
2·1 ccm.	26° C.
2·9	33
4·3	43
7·4	55
8·9	63
10·3	70
12·1	75
15·0	87
16·0	95

He obtained similar results for cobalt bromide, the following being his numbers:

Amount of water added.	Requisite Temperature.
3·0 ccm.	51° C.
4·3	57
7·4	91

From the short abstract of Russell's paper, to which alone I have access, I cannot ascertain with what degree of accuracy the spectra were observed. Nor are the thicknesses of the solutions stated through which the light was passed. Probably he used the same thickness in all his experiments, as his object was, not to determine the effect of increase of concentration, but to obtain data for determining the constitution of a solution by observing its absorption spectrum. But while his observations are therefore not conclusive, they go to shew that, in the case of these salts, increase of concentration and elevation of temperature have the same effect on the absorption spectrum.

G. Krüss[1] has observed the relative intensity of light from different regions of the spectrum transmitted through a few dilute solutions of permanganate of potash; and from the results of these observations the effect of increase of concentration on the absorption may be determined.

Krüss used the same thickness of absorbing solution throughout his experiments. But as the light employed in any one observation was practically homogeneous, Lambert's law may be applied to find what the intensity of the transmitted light would have been, had the thicknesses of the absorbing solutions been inversely as their concentrations.

[1] G. and H. Krüss: 'Kolorimetrie,' Hamburg, 1891, p. 150.

I have made the calculations necessary for this purpose ; and in the tables given below the intensities of transmitted light are for such thicknesses of the solutions compared that the product of thickness into concentration is constant. These tables, therefore, show the variation of absorption with concentration. The intensities of transmitted light are in all cases expressed as fractions of those of the incident light. The regions of the spectrum examined are indicated by the terminal and mean wave lengths in millionths of a millimetre.

It should be noted that the calculations by which the intensities of light for the more dilute solutions of the following tables have been determined, necessarily increase the errors of the original observations in the ratio of the concentrations of the solutions compared. The intensities given for dilute solutions are thus in all cases less accurate than those for strong solutions. No small effects can therefore be regarded as established by the relative values of the intensities of the following tables. But such small effects may be indicated in this way. And any uniformity in the small effects indicated may serve to establish a *primâ facie* case, and to show at any rate that a direct experimental study of the subject is desirable.

The first table shows the absorption at both ends of the absorption band extending from about wave length 590 to wave length 460 in solutions containing 0·001 and 0·00025 grm. of the salt per cu. cm. :—

Region of Spectrum.		Intensity of Light for Solution containing, per cu. cm.,	
Terminal Wave Lengths.	Mean Wave Length.	0·001 grm. of Salt.	0·00025 grm. of Salt,
680·7—650·1	665·4	0·337	0·352
650·1—613·2	631·7	0·191	0·208
613·2—596·4	604·8	0·083	0·080
596·4—582·8	589·6	——	0·024
474·8—462·1	468.9	——	0·006
462·1—456·5	459·3	——	0.037
456·5—450·4	453·5	——	0·079
450·4—438·2	444·3	0·198	——

If these results be treated graphically, curves being drawn for both solutions with the mean wave lengths of the regions of the spectrum examined, as abscissæ, and the intensities of light as ordinates, it will be observed (1) that at the red-ward end of the band the curves for both solutions seem to cut the axis of intensities at the same point ; (2) that at the red-ward end the curve for the weaker solution is steeper than the curve for the stronger solution, and (3) that at the violet-ward end of the band the one point which the experiments determine for the strong solution lies almost exactly on the curve for the weak solution. In other words the violet-ward end of the band seems to be unchanged by the increase of concentration under consideration ; at the red-ward end the position of the boundary of complete absorption seems also to be unchanged, but the portion of the band in which the absorption is incomplete, which we may call for shortness its penumbra, seems to have extended somewhat towards the red.

The next table gives similar results for solutions containing, per cu. cm., 0·00025 and 0·000125 of the salt:

Region of Spectrum.		Intensity of Light for Solution containing, per cu. cm.,	
Terminal Wave Lengths.	Mean Wave Length.	0·00025 grm. of Salt.	0·000125 grm. of Salt.
596·4—582·8	589·6	0·393	0·473
582·8—572·9	577·8	0·193	0·199
572·9—558·6	565·7	0·038	——
558·6—544·8	551·7	——	0·001
501·6—494·7	498·2	——	0·020
494·7—486·5	490·6	0·043	0·053
486·5—480·9	483·7	0·076	0·082
480·9—474·8	477·8	0·154	0·194

Graphical treatment of these results shows (1) that at the violet-ward end of the band the two curves are very similar in form, but different in position, the strong solution curve being nearer the violet by about two wave-length divisions, and (2) that at the red-ward end the strong solution curve is much less curved than the weak solution curve, and seems to cut the axis of intensities at a point about eight wave-length divisions nearer the red. In other words increase of concentration in this case seems to widen the range of complete absorption towards both ends, but more towards the red than towards the violet. The penumbra of the violet end is simply displaced slightly towards the violet, while that of the red end is both displaced towards the red and has its relative intensity in different parts changed.

The following table gives results similar to the above in the case of two still more dilute solutions. They are especially interesting, because the observations extend right across an absorption band.

Region of Spectrum.		Intensity of Light for Solution containing, per cu. cm.,	
Terminal Wave Lengths.	Mean Wave Length.	0·000125 grm. of Salt.	0·0000625 grm. of Salt.
544·8—535·6	540·2	0·045	0·076
535·6—524·1	529·9	0·034	0·040
524·1—516·8	520·5	0·039	0·044
516·8—501·6	509·2	0·067	0·086

The fact that the intensity of the light in the second of these regions is, in the case of both solutions, less than in the others, shews that somewhere between wave lengths

544·8 and 516·8 we have one of the absorption bands characteristic of dilute solutions of this salt. It is impossible to determine from these observations the exact wave length of the centre of the band, *i.e.*, of the minimum of intensity of light, in the case of either solution. But it is easy to see that in the case of the strong solution it has a greater wave length than in that of the weak solution. From the approximate equality of the intensities of light in the second and third regions, in the case of the weaker solution, it is obvious that the centre of its band is near the common boundary of these regions, while the relatively much greater difference between the intensities in the same regions, in the case of the stronger solution, shews that the centre of its band is well within the second region. If curves be drawn as above, it will be found that the wave length of the centre of the band in the case of the weaker solution is about 528, while in the case of the stronger solution it is about 530. The general form of the curves is the same. But the curve for the weak solution is higher than the other throughout, the difference being greatest at the red-ward side of the band. In other words, the absorption of the strong solution is greater than that of the weak throughout and the amount by which its absorption is the greater is greater on the red side than on the violet side of the centre of the band.

In all the solutions examined, therefore, of this salt, increase of concentration seems to extend the absorption at the red-ward end of a band more than it does at the violet-ward end.

G. and H. Krüss[1] have examined the effect of elevation of temperature on the position of all five of the absorption bands of a dilute solution of the same salt. Their results are as follows:

Number of band.	Wave length of darkest part of band at a temperature of			
	20° C.	40° C.	60° C.	80° C.
1	574·9	576·0	576·5	576·8
2	550·9	551·5	552·9	553·7
3	524·0	526·3	527·0	527·6
4	505·8	506·4	507·5	508·5
5	486·4	487·1	488·1	489·7

In all cases, therefore, elevation of temperature causes the bands to move towards the red end of the spectrum—the same effect as is shown above to follow upon increase of concentration.

Vierordt[2] has made observations on solutions of different strengths of Potassium monochromate, similar in all respects to those of G. Krüss referred to above. I have treated them in the same way, and the results are given in the following two tables. Potassium monochromate has a one-sided absorption spectrum, light of the shorter wave

[1] 'Kolorimetrie,' p. 273.

[2] Ibid., p. 165.

lengths being absorbed by its solutions. The regions of the spectrum for which I give Vierordt's observations are, therefore, on the red-ward side only of the absorption band.

The first table gives observations on the three strongest solutions examined:

Region of Spectrum.		Intensity of Light for Solution containing, per cu. cm.,		
Terminal Wave Lengths.	Mean Wave Length.	0·0361 grm. of Salt.	0·009025 grm. of Salt.	0·002256 grm. of Salt.
517·1—508·5	512·8	0·530	0·522	—
508·5—501·2	504·9	0·455	0·431	—
501·2—494·3	497·8	0·255	0·227	—
494·3—486·1	490·2	—	0·051	0·042
486·1—480·6	483·7	—	—	0·0001

If these results be plotted in the same way as above it will be found (1) that the curve of the strongest solution is highest and that of the weakest solution lowest; (2) that the curve for the strongest solution at the point corresponding to wave length 497·8 is steeper than the curve for the intermediate solution at the point corresponding to the same wave length, and that the latter at the point corresponding to wave length 490·2 is steeper than the curve for the weakest solution at the point corresponding to the same wave length; and consequently (3) that if the curves be produced beyond the limits of the experiments, until they cut the line of zero intensity, in such a way as to maintain the general trend which they have within the limits of the experiments, the curve for the strongest solution will cut the line of zero intensity at a point nearer the red than the others, and the curve for the weakest solution at a point farther from the red than the others. In other words, the region of complete absorption seems to move somewhat towards the red with increase of concentration, while the absorption in the penumbra diminishes.

The next table gives the observations on the two weakest solutions examined:—

Region of Spectrum.		Intensity of Light for Solution containing, per cu. cm.,	
Terminal Wave Lengths.	Mean Wave Length.	0·002256 grm. of Salt.	0·000564 grm. of Salt.
494·3—486·1	490·2	0·820	—
486·1—480·6	483·7	0·565	0·573
480·6—474·5	477·6	0·535	0·437
474·5—468·4	471·4	0·305	0·299

If these results be represented graphically it will be found that the curves are not quite so simply related as those of the stronger solutions. But between wave lengths

483 and 471·4 the curve of the stronger solution is above the other. At 471·4 it crosses the curve of the weaker solution. And consequently if both curves be produced so as to maintain their general trend, until they cut the line of zero intensity, the curve for the stronger solution will cut it at a point nearer the red than that for the weaker solution. In other words, increase of concentration seems to extend the region of complete absorption towards the red, while it diminishes the absorption in the penumbra up to wave length 483.

With regard to the effect produced by elevation of temperature on the absorption of solutions of this salt, G. and H. Krüss give[1] the following observations on a 1 per cent. solution:—

Region of Spectrum.		Intensity of Light at a temperature of	
Terminal Wave Lengths.	Mean Wave Length.	20° C.	60°–70° C.
522·7—513·2	517·9	0·840	0·796
482·8—475·0	478·9	0·436	0·404

But these observations show only that elevation of temperature slightly increases the intensity of the absorption at two regions of the penumbra. Melde,[2] however, found that in solutions of this salt, elevation of temperature is accompanied by an extension of the absorption region towards the red. He gives no quantitative details.

Thus the available observations on solutions of Potassium monochromate also, so far as they go, seem to support the conclusions reached above.

The above results are, for the reasons already stated, by no means conclusive, even with regard to solutions of the four salts to which they refer; and even if they were, no general conclusion could be drawn from so few instances. But they are all in agreement with the deductions made from the working hypotheses referred to above, and they therefore shew it to be desirable that a more complete investigation of this subject should be made.

Note added November 7th, 1891.—Since the above was written a paper has been published by O. Knoblauch[3] on the effect of increase of concentration on the absorption spectra of dilute solutions. His results enable us to apply additional tests to the conclusions reached above.

Of the solutions already referred to, Knoblauch examined only those of Potassium monochromate. He found that the absorption of a solution of this salt, containing 400 grm. of salt per cu. dm., began at wave length 490 (millionths of a millimetre) and became complete at wave length 482, whereas the absorption of a solution, containing only 0·023 grm. of salt per cu. dm., began at wave length 510 and became complete at wave length 496. Increase of concentration therefore was accompanied by extension of the luminous portion of the spectrum towards the violet. The thicknesses of his solutions

[1] 'Kolorimetrie,' p. 278.

[2] 'Pogg. Ann.,' Bd. cxxvi (1865), p. 264.

[3] 'Pogg. Ann.,' Bd. xliii (1891), p. 738.

were adjusted so as to be very nearly inversely as the concentrations. The thickness of the weak solution was, however, a little less than exact adjustment required. With exact adjustment therefore there would have been a still greater relative motion of the regions of absorption. He states also that two other series of observations with solutions having smaller differences of concentration showed a motion of the absorption region in the same sense, but he does not say what the concentrations were in these cases. Knoblauch ascribes this observed effect of change of concentration to a supposed decomposition of the salt by the water. Possibly it may be so. But it is worth noting that the concentration of his strong solution was very considerable, and that, as shown above, the effect which he observed is exactly the effect which is to be expected in the case of strong solutions; for we saw that in such cases increase of concentration will produce an opposite effect to that of elevation of temperature.

Knoblauch examined two solutions of picric acid, one containing 9·3 and the other 0·00141 grm. per cu. dm., the thicknesses being inversely as the concentrations; and he found that when allowance was made in the case of the weaker solution for the selective absorption of the water, the two spectra were undistinguishable. Melde found that the absorption region of the spectrum of a solution of this acid (a one-sided spectrum with absorption at the violet end) was extended towards the red by elevation of temperature. According to the above hypotheses, therefore, increase of concentration may be expected to produce the same effect in solutions of moderate strength. But it will be noted that Knoblauch's solutions were both comparatively weak. His result, therefore, is in agreement with the conclusions reached above.

Of the potassium salt of eosin, the so-called "soluble eosin," Knoblauch examined two pairs of solutions, containing respectively 6·5 and 0·65, and 0·26 and 0·0000157 grms. per cu. dm. In the case of the stronger solutions it is not clear that their thicknesses were exactly adjusted. In the case of the weaker they were. In the former he observed one of the absorption bands of the stronger solution to be nearer the red than in the weaker solution. In the latter he says the absorption spectra were the same, without giving the wave lengths of the boundaries of the regions of complete and of incomplete absorption. Though he says the absorption spectra in the case of the weak solutions were the same, he says also that they were so nearly identical with the spectra of solutions of nearly corresponding concentrations of the sodium salt that the diagram given for the latter may be taken also as representing the former; and according to that diagram, while the violet-ward boundary of the absorption band is the same for solutions containing 1 and 0·000137 grm. per cu. dm., the red-ward boundary of the stronger solution is nearer the red than that of the weaker, the red-ward boundary of the region of complete absorption being, however, the same in both. On the whole, therefore, if increase of concentration has any effect other than change of intensity on the absorption of this salt, it would seem to be a slight extension of absorption towards the red.

With regard to the effect of elevation of temperature on the absorption of solutions of this salt, G. and H. Krüss[1] give several series of observations. They found, by spectroscopic observations, in the case of a solution whose strength they do not specify, that on changing the temperature from 20° to 40°, 60° and 80° C., the position of the point of maxi-

[1] 'Kolorimetrie,' pp. 275 and 278.

mum absorption changed from wave length 511·4 to 511·6, 512·4 and 514·7 respectively, moved therefore slightly towards the red.

They made also a series of photometric observations with a solution containing 0·001 per cent. of salt the results of which are given in the following table:—

Region of Spectrum.		Intensity of Light at a Temperature of	
Terminal Wave Lengths.	Mean Wave Length.	20° C.	60°–70° C.
678·9—656·2	667·5	0·868	0·884
627·5—609·3	618·4	0·872	0·840
583·6—571·6	577·6	0·864	0·816
568·1—556·6	562·7	0·756	0·668
522·7—513·2	517·9	0·020	0·048
501·6—493·6	497·6	0·060	0·080
482·8—475·0	478·9	0·124	0·144
469·0—461·5	465·2	0·260	0·276

If these results be treated graphically it will be seen that from about wave length 646 to wave length 540 the low temperature curve is the higher of the two; that from this position downwards the high temperature curve is the higher, but that it and the low temperature curve gradually approach one another after turning away from the line of zero intensity from wave length 517·9 on. Where the turn occurs cannot be determined exactly; but if it be noted that between wave lengths 562·7 and 517·9 the low temperature curve has to descend through a distance ·736, the high temperature curve only through ·620, and that between these wave lengths both have to turn and attain almost the same upward slope, it is obvious that the high temperature curve would seem to have its turning point at a higher wave length than the other. In other words the effect of increase of temperature seems to be to increase somewhat the intensity of the violet-ward penumbra, while leaving the position of its boundary unchanged, to move the point of maximum absorption very slightly towards the red, to increase somewhat the intensity of that portion of the red-ward penumbra which is near the point of maximum absorption, and to diminish the intensity of the remaining portion.

Finally G. and H. Krüss quote experiments by Dr. Müller[1] with a 1 per cent. solution of this salt in which he found that at 20° C. the region of maximum absorption was bounded by wave lengths 516.9 and 509.8 and the fraction of the incident light absorbed was 0·52, while at 60°–70° C. the region 518—510·9 showed a maximum absorption amounting to 0·59.

Thus the results of all these experiments with the potassium salt of eosin are in close agreement with the deductions from the working hypotheses made above.

Knoblauch also examined the effect of increase of concentration on solutions of three

[1] 'Kolorimetrie,' pp. 278 and 280.

Uranium salts. In one case in which he compared solutions containing respectively 569, and less than 0·166, grm. per cu. dm., he found the bands of the strong solution (whose concentration it will be noticed was very considerable) nearer the violet than in the weak solution. In another in which the concentrations were 29 and 0·065 gm. per cu. dm. respectively, he found the bands to occupy the same positions in the spectra of both, but the boundary of the complete absorption of the violet end to be very slightly nearer the violet in the strong than in the weak solution. In a third case in which the concentrations were 320 and 0·128 grm. per cu. dm., he found the spectra undistinguishable. It would be interesting to compare with these results those obtained by Morton[1] in his observations of the absorption spectra of solutions of salts of the same metal. But I have not access to his paper. The only account of it which I have seen says simply that he found that elevation of temperature in general displaces the absorption bands towards the red, but that in some cases no displacement is produced. I do not even know whether or not both observers made experiments on the same salts. In the meantime, therefore, I cannot determine whether a comparison of the results of these observers would confirm or throw doubt upon the conclusions reached above.

[1] 'Fortschritte der Physik,' Jahrgang xxix, p. 424.

VI.—*On the Symbolic Use of Demoivre's Function.*

By Prof. N. F. DUPUIS, Queen's University, Kingston.

(Read May 29, 1891.)

The contents of this paper are as follows :—

I. The properties and laws of transformation of the operative symbol $V\theta$ where V is a contraction for Demoivre's function,—

$$\text{Cos}\ \theta + i \sin \theta.$$

II. Applications of the operator V in the summation of certain trigonometric series, and the expansion of certain functions.

I.

(1.) We define $V\theta$ to be such a function of θ that $Vn\theta = (V\theta)^n$; or writing the right-hand member after the form usually adopted for trigonometric ratios, $Vn\theta = V^n\theta$, where n and θ are any quantities whatever.

We know that this relation is satisfied by Demoivre's function, $\cos\theta + i \sin\theta$, and hence that $V\theta \equiv \cos\theta + i \sin\theta$.

(2.) Since $V(-\theta) \equiv \cos(-\theta) + i \sin(-\theta) = \cos\theta - i \sin\theta$, we have $V(-\theta) = V^{-1}\theta$.

(3.) $$V(2k\pi) = \text{Cos}\ 2k\pi + i \sin 2k\pi = V2\pi = +1,$$
$$V(2k+1)\pi = \text{Cos}\ (2k+1)\pi + i \sin (2k+1)\pi = V\pi = -1;$$

where k is any positive integer.

(4.) Since $Vn\theta = V^n\theta = V^{\theta}n$,

$$\therefore\ Vn\theta \times Vn\varphi = V^{\theta}n \times V^{\phi}n = Vn(\theta+\varphi) = V(n\theta+n\varphi).$$

Or making $n = 1$,

$$V\theta \cdot V\varphi = V(\theta+\varphi);$$

and $$V\theta \cdot V(-\varphi) = V(\theta-\varphi).$$

(5.) $$V(\pi+\theta) = V\pi \cdot V\theta = -1 \cdot V\theta = -V\theta,$$

by the second part of (3.)

(6.) $$\begin{aligned} V^2\theta &= V\theta \cdot V\theta = (\cos\theta + i \sin\theta)\, V\theta \\ &= \cos\theta\,(\cos\theta + V\theta + i \sin\theta) - 1 \\ &= 2\cos\theta\ V\theta - 1 \end{aligned}$$

Addition Theorem.

(7.) $$\begin{aligned} V\theta + V\varphi &= \cos\theta + \cos\varphi + i\,(\sin\theta + \sin\varphi) \\ &= 2\cos\tfrac{1}{2}(\theta+\varphi)\cos\tfrac{1}{2}(\theta-\varphi) + 2i \sin\tfrac{1}{2}(\theta+\varphi)\cos\tfrac{1}{2}(\theta-\varphi). \\ &= 2\cos\tfrac{1}{2}(\theta-\varphi)\ V\tfrac{1}{2}(\theta+\varphi) \end{aligned}$$

(8.) In a similar manner we find,—

$$V\theta - V\varphi = 2\,i \sin \tfrac{1}{2}(\theta - \varphi)\; V\tfrac{1}{2}(\theta + \varphi).$$

(9.) $$\mathrm{Log}_e V\theta = \log_e (\cos\theta + i \sin\theta) \;\; \log_e e^{i\theta} = i\,\theta.$$

(10.) $$\frac{d}{d\theta} V\theta = i\,V\theta;\; \frac{d^2}{d\theta^2} V\theta = -V\theta;$$
$$\frac{d^3}{d\theta^3} V\theta = -i\,V\theta;\; \frac{d^4}{d\theta^4} V\theta = V\theta,$$

the differential coefficients being periodic.

(11.) $$\int V\theta\, d\theta = -i\,V\theta;\;\; \iint V\theta\, d\theta\, d\theta = -V\theta;\; \&c.,$$

the integrals being periodic.

(12.) $$V\theta + V^{-1}\theta = V\theta + V(-\theta) = 2\cos\tfrac{1}{2}(\theta + \theta)\; V\tfrac{1}{2}(\theta - \theta) = 2\cos\theta.$$

(13.) $$V\theta - V^{-1}\theta = V\theta - V(-\theta) = 2\,i \sin\tfrac{1}{2}(\theta + \theta)\; V\tfrac{1}{2}(\theta - \theta) = 2\,i \sin\theta.$$

(14.) When the expression $1 - V\theta$ is multiplied by $1 - V^{-1}\theta$, it is rendered real. Or more generally, $1 - x\,Vn\theta$ is a realizing factor for $1 - x\,V^{-1}n\theta$; and reciprocally.

Similarly $1 + x\,V^{-1}n\theta$ is a realizing factor for $1 + x\,Vn\theta$; and reciprocally.

The realized product in the first case becomes

$$1 - x\,(Vn\theta + V^{-1}n\theta) + x^2,$$

which reduces to

$$1 - 2\,x \cos(n\theta) + x^2.$$

In the second case it reduces to

$$1 + 2\,x \cos(n\theta) + x^2.$$

(15.) The realizing factor for $1 - ix\,Vn\theta$ is $1 + ix\,V^{-1}n\theta$; and conversely. The realized product is $1 + 2x \sin(n\theta) + x^2$.

Similarly, the realizing factor for $1 + ix\,Vn\theta$ is $1 - ix\,V^{-1}n\theta$, and the realized product is $1 - 2x \sin(n\theta) + x^2$.

Ex.: To express $\dfrac{1 + i\,V\theta}{1 - i\,V\theta}$ with a real denominator.

$$\frac{1 + i\,V\theta}{1 - i\,V\theta} \times \frac{1 + i\,V^{-1}\theta}{1 + i\,V^{-1}\theta} = \frac{2i\cos\theta}{2 + 2\sin\theta} = \frac{i\cos\theta}{1 + \sin\theta}.$$

II.

Ex. 1. To factorize $x^n - 1$ with n even.

Equating to zero gives $\quad x^n = 1 = V2k\pi \qquad$ (3.)

$$\therefore\;\; x = V^{\frac{1}{n}}2k\pi = V\frac{2k\pi}{n},$$

where k is to take all integral positive values from 0 to $n-1$ inclusive.

When $k = 0, \frac{n}{2}, 1, \frac{n}{2} + 1, 2, \frac{n}{2} + 2$, &c.

$$x = 1, -1, \quad V\frac{2\pi}{n}, \quad -V\frac{2\pi}{n}, \quad V\frac{4\pi}{n}, \quad -V\frac{4\pi}{n}, \quad \&c.$$

by the application of (5.)

Then the linear factors are

$$(x-1)\ (x+1)\ \left(x - V\frac{2\pi}{n}\right)\ \left(x + V\frac{2\pi}{n}\right)\ \left(x - V\frac{4\pi}{n}\right)\ \left(x + V\frac{4\pi}{n}\right)\ \cdots$$

And by multiplication the quadratic factors are—

$$(x^2-1)\ \left(x^2 - V^2\frac{2\pi}{n}\right)\ \left(x^2 - V^2\frac{4\pi}{n}\right)\ \left(x^2 - V^2\frac{6\pi}{n}\right)\ \cdots;$$

or reducing by means of (6),

$$(x^2-1)\ \left(x^2 - 2x\cos\frac{2\pi}{n} + 1\right)\ \left(x^2 - 2x\cos\frac{4\pi}{n} + 1\right)\cdots$$

In a similar manner are factored the cases where n is odd, and where -1 is written for $+1$.

Ex. 2. To sum to n terms the series

$$\text{Cos}\ \alpha + \cos(\alpha+\theta) + \cos(\alpha+2\theta) + \ldots \cos(\alpha + \overline{n-1}.\theta);$$

And $\text{Sin}\ \alpha + \sin(\alpha+\theta) + \sin(\alpha+2\theta) + \ldots \sin(\alpha + \overline{n-1}.\theta)$.

Denote the sum of the first by C and of the second by S.

$$\begin{aligned} \text{Then,}\quad C + iS &= V\alpha + V(\alpha+\theta) + V(\alpha+2\theta) + \ldots V(\alpha + \overline{n-1}.\theta) \\ &= V\alpha\left\{1 + V\theta + V^2\theta + V^3\theta + \ldots V^{n-1}\theta\right\} \\ &= \frac{V\alpha\,(1 - Vn\theta)}{1 - V\theta}, \end{aligned}$$

by making use of (1) and summing $1 + V\theta + (V\theta)^2 + \ldots$ as a geometric series.

The realizing factor for the denominator being $1 - V^{-1}\theta$, we multiply both parts of the fraction by this and obtain

$$\frac{V\alpha - V(\alpha+n\theta) - V(\alpha-\theta) + V(\alpha + \overline{n-1}.\theta)}{2 - (V\theta + V^{-1}\theta)};$$

which, upon reducing the numerator by (12) and the denominator by (7) gives—

$$C + iS = \frac{\text{Sin}\ \frac{1}{2}\,n\,\theta\,.\,V\,(\alpha + \frac{1}{2}\,\overline{n-1}\ \theta)}{\text{Sin}\ \frac{1}{2}\ \theta}$$

and equating real, and imaginary parts, we have finally,

$$C = \frac{\text{Sin}\ \frac{1}{2}\,n\,\theta\cos(\alpha + \frac{1}{2}\,\overline{n-1}\ \theta)}{\text{Sin}\ \frac{1}{2}\ \theta}$$

$$S = \frac{\text{Sin}\ \frac{1}{2}\,n\,\theta\sin(\alpha + \frac{1}{2}\,\overline{n-1}\ \theta)}{\text{Sin}\ \frac{1}{2}\ \theta}$$

Ex. 3. To sum to infinity the series—

$$\text{Cos}\ \alpha + x\cos(\alpha+\theta) + x^2\cos(\alpha+2\theta) + \ldots$$

And $\text{Sin}\ \alpha + x\sin(\alpha+\theta) + x^2\sin(\alpha+2\theta) + \ldots$

Denoting the sum of the first by C, and of the second by S,

$$C + iS = V\alpha + xV(\alpha+\theta) + x^2V(\alpha+2\theta) + \ldots$$
$$= V\alpha \left\{1 + xV + x^2V^2 + x^3V^3 + \ldots\right\}$$

by separation of symbols,

$$= \frac{V\alpha}{1-xV\theta}.$$

Realizing the denominator by (14), and equating real parts, and also imaginary parts, gives,

$$C = \frac{\text{Cos}\ \alpha - x\cos(\alpha-\theta)}{1-2x\cos\theta+x^2};$$
$$S = \frac{\text{Sin}\ \alpha - x\sin(\alpha-\theta)}{1-2x\cos\theta+x^2}.$$

Ex. 4. To find the generating function of

$$1+3x\sin\theta+11x^2\sin 2\theta+43x^3\sin 3\theta+\ldots$$

Denote the G. F. of the series by S, and of that of the conjugate series, in the cosines, by C. Then—

$$C + iS = 1 + i + 3xV + 11x^2V^2 + 43x^3V^3 + \ldots;$$

and taking xV as the variable, the G. F. of this series is

$$i + \tfrac{1}{3}\left\{\frac{2}{1-4xV} + \frac{1}{1-xV}\right\}.$$

Thence, realizing denominators, and equating real and imaginary parts, gives—

$$S = 1 + \tfrac{1}{3}\left\{\frac{8x\sin\theta}{1-8x\cos\theta+16x^2} + \frac{x\sin\theta}{1-2x\cos\theta+x^2}\right\};$$
$$C = \tfrac{1}{3}\left\{\frac{2-8x\cos\theta}{1-8x\cos\theta+16x^2} + \frac{1-x\cos\theta}{1-2x\cos\theta+x^2}\right\}.$$

Ex. 5. To find the generating functions of

$$x\cos\theta - \frac{x^2}{2}\cos 2\theta + \frac{x^3}{3}\cos 3\theta - + \ldots$$

And $$x\sin\theta - \frac{x^2}{2}\sin 2\theta + \frac{x^3}{3}\sin 3\theta - + \ldots$$

As the generating functions of these series are not functions of the same species, the series are better dealt with separately.

Denote the G. F. s by C and S, as before. Then,

1. $$2C = x(V+V^{-1}) - \frac{x^2}{2}(V^2+V^{-2}) + \frac{x^3}{3}(V^3+V^{-3}) + - \ldots$$
$$= xV - \frac{x^2V}{2} + \frac{x^3V^3}{3} - + \ldots$$
$$+ xV^{-1} - \frac{x^2V^{-2}}{2} + \frac{x^3V^{-3}}{3} - + \cdots$$
$$= l(1+xV) + l(1+xV^{-1})$$
$$= l(1+2x\cos\theta+x^2) \text{ by reduction.}$$

2. $$2iS = x(V - V^{-1}) - \frac{x^2}{2}(V^2 - V^{-2}) + \frac{x^3}{3}(V^3 - V^{-3}) - + \ldots$$
$$= l(1 + xV) - l(1 + xV^{-1})$$
$$= l.\frac{1 + xV}{1 + xV^{-1}}$$

Now, denoting $\sin\theta$ by s and $\cos\theta$ by c,

$$2iS = l(\overline{1 + cx} + isx) - l(\overline{1 + cx} - isx)$$
$$= l\left\{1 + \frac{isx}{1 + cx}\right\} - l\left\{1 - \frac{isx}{1 + cx}\right\}$$
$$= 2i\left\{\frac{sx}{1 + cx} - \tfrac{1}{3}.\frac{s^3x^3}{(1 + cx)^3} + \tfrac{1}{5}.\frac{s^5x^5}{(1 + cx)^5} - + \cdots\right\}$$
$$= 2i\tan^{-1}\frac{x\sin\theta}{1 + x\cos\theta}.$$

Or, thus—

$$\frac{1 + xV}{1 + xV^{-1}} = \frac{(1 + xV)^2}{1 + 2x\cos\theta + x^2} = V2S = \cos 2S + i\sin 2S.$$
$$\therefore\ VS = \frac{1 + xV}{\sqrt{\{1 + 2x\cos\theta + x^2\}}} = \cos S + i\sin S,$$

Hence equating real, and also imaginary parts,

$$\text{Sin } S = \frac{x\sin\theta}{\sqrt{\{1 + 2x\cos\theta + x^2\}}},$$
$$\text{Cos } S = \frac{1 + x\cos\theta}{\sqrt{\{1 + 2x\cos\theta + x^2\}}}.$$

Whence $\tan S = \dfrac{x\sin\theta}{1 + x\cos\theta}$, and $S = \tan^{-1}\dfrac{x\sin\theta}{1 + x\cos\theta}$.

Ex. 6. To expand $\dfrac{x\sin\theta}{1 - 2x^2\cos\theta + x^4}$ in ascending powers of x, and multiples of θ.

This expression is $\dfrac{1}{2i}\cdot\dfrac{x(V - V^{-1})}{(1 - x^2V)(1 - x^2V^{-1})}$.

Assuming $\dfrac{x(V - V^{-1})}{(1 - x^2V)(1 - x^2V^{-1})} \equiv \dfrac{Ax}{1 - x^2V} + \dfrac{Bx}{1 - x^2V^{-1}}$,

we readily find, after the manner of partial fractions, that $A = V$, and $B = -V^{-1}$.

$$\therefore\ \frac{x(V - V^{-1})}{(1 - x^2V)(1 - x^2V^{-1})} = x(V - V^{-1}) + x^3(V^2 - V^{-2}) + x^5(V^3 - V^{-3})\cdots$$
$$= 2i\{x\sin\theta + x^3\sin 2\theta + x^5\sin 3\theta + \ldots\}$$

and, dividing by $2i$,

$$\frac{x\sin\theta}{1 - 2x^2\cos\theta + x^4} = x\sin\theta + x^3\sin 2\theta + x^5\sin 3\theta + \cdots$$

Ex. 7. Given $\tan\varphi = n\tan\theta$ to express φ in terms of the functions of θ and its multiples.

Here, $$\frac{V\varphi - V^{-1}\varphi}{V\varphi + V^{-1}\varphi} = \frac{nV\theta - nV^{-1}\theta}{V\theta + V^{-1}\theta}.$$

whence by reduction we easily obtain,

$$V2\varphi = \frac{(1+n)\ V2\theta + (1-n)}{(1+n) + (1-n)\ .\ V2\theta}$$

$$= V2\theta.\ \frac{1 + m\ V^{-1}2\theta}{1 + m\ V2\theta},\ \text{where } m = \frac{1-n}{1+n}.$$

Taking logarithms—

$$2i\,\varphi = 2i\,\theta - 2i\,m \sin 2\theta + 2i.\ \frac{m^2}{2} \sin 4\theta - + \ldots$$

$$\therefore\ \varphi = \theta - m \sin 2\theta + \frac{m^2}{2} \sin 4\theta - + \ldots$$

Ex. 8. To develope $\cos n\theta \cos^n\theta$ and $\sin n\theta \cos^n\theta$ in powers of $\tan\theta$.

Take $\cos^n\theta\ Vn\theta$

$$\text{Then}\quad \cos^n\theta\ Vn\theta = \left(\frac{\text{Cos}\ \theta}{V^{-1}\theta}\right)^n = \left(\frac{\text{Cos}\ \theta}{\cos\theta\,(1 - i\tan\theta)}\right)^n$$

$$= (1 - i\tan\theta)^{-n}$$

$$= 1 + ni\tan\theta + \frac{n(n+1)}{2\,!}\ i^2\tan^2\theta + \frac{n(n+1)\,(n+2)}{3\,!}\ i^3\tan^3\theta + \ldots$$

and equating real parts, and also imaginary parts, gives—

$$\text{Cos}^n\theta \cos n\theta = 1 - {}^nH_2 \tan^2\theta + {}^nH_4 \tan^4\theta - + \ldots$$

And $$\text{Cos}^n\theta \sin n\theta = n\tan\theta - {}^nH_3 \tan^3\theta + {}^nH_5 \tan^5\theta - + \ldots$$

where ${}^nH_r$ denotes the number of homogeneous terms of r dimensions which can be made from n letters and their powers.

Ex. 9. Given $\sin A = \frac{a}{b} \sin (A+C)$ to develope the angle A in terms of the functions of C and its multiples.

$$\text{Here,}\quad VA - V^{-1}A = \frac{a}{b} V(A+C) - \frac{a}{b} V^{-1}(A+C).$$

$$= \frac{a}{b} VA \cdot VC - \frac{a}{b} V^{-1}A \cdot V^{-1}C.$$

$$\text{Whence}\qquad V2A = \frac{1 - \frac{a}{b} V^{-1}C}{1 - \frac{a}{b} VC}.$$

And taking logarithms—

$$2iA = 2i\frac{a}{b} \sin C + 2i\frac{a^2}{2b^2} \sin 2C + \ldots$$

$$\therefore\ A = \frac{a}{b} \sin C + \frac{a^2}{2b^2} \sin 2C + \frac{a^3}{3b^3} \sin 3C + \ldots$$

VII.—*Newton's use of the Slit and Lens in forming a pure spectrum.—Common error concerning this.—Effectiveness of Newton's method in showing the dark lines on a screen.*

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I. GENERAL.

The object of the following paper is threefold: first, to call attention to an error which is spreading through scientific books and does injustice to Newton's work in optics; secondly, to point out the extraordinary fact that not only *Newton's method but his actual experiments were fully sufficient, with ordinary luck, to show the dark lines in the solar spectrum*, while, as we know, he did not see them; thirdly, to suggest that a republication of the last edition of Newton's "Opticks" is of sufficient value to students of science of the present day to justify the outlay. The book is not easy of access, yet much may be learned from the account of the original experiments; moreover, when one writer, not having the original at hand, copies from another statements concerning it, error easily arises and is readily propagated. It would be most fitting that Newton's own university should undertake this republication.

The error I wish to point out is the statement that Newton never used the slit in producing the spectrum, and therefore could not have produced homogeneous light, that is, as I take it, sufficiently homogeneous to show the dark lines in the solar spectrum.

The following quotations may be submitted:—

Roscoe ("Spectrum Analysis," 1869, p. 22) says: "The first person who observed these dark lines was Dr. Wollaston. Newton did not observe them, and for the good reason that he allowed the light to fall on the prism from a round hole in the shutter."—"If he had allowed the light to pass through a fine vertical slit, and if this slit of light, if we may use such a term, had then fallen upon the prisms, placed so that the edge of the refracting angle is parallel to the slit, he would have observed that the solar spectrum is not continuous, but broken up by permanent dark lines."

Lockyer ("The Spectroscope," 1873, p. 18) says: "It is very curious, however, that Newton, although he made many experiments on prisms, really omitted one of the most important points."—"Newton made a round hole in a shutter for his experiments, but we now know he ought not to have done that: he ought to have made a slit; but this did not come out until 1802, when Dr. Wollaston, by merely using a slit instead of a round hole, made a tremendous step in advance."

In Parkinson's "Optics," second edition, 1866 (a Cambridge book), the same error is contained, not as a direct statement, but by implication, for, after describing Newton's experiment with a small aperture, it says, p. 149: "Instead of a very small aperture Wollaston and Fraunhofer admitted the sun's light through a very narrow slit, the effect of the slit being to give an assemblage of innumerable linear spectra placed side by side."

Proctor ("Spectroscope," 1877, p. 16) does not seem to be aware that Newton had used a narrow slit, for although he refers to his using an "oblong" and a "triangular" aperture as well as other shapes, yet it appears, from his contrasting these with Wollaston's use of a slit as well as from his diagram, that he considered the triangles (equilateral) and the "oblongs" to be about the same size as the round hole also employed by Newton. It appears, however, more definitely from his work on "The Sun" (p. 101, 1872) that he shared the common error. He says: "Wollaston found that when, instead of a circular, triangular or oblong aperture, a very narrow slit is employed, light of certain degrees of refrangibility is absent from the solar beam;" and on the same page he remarks: "This mode of viewing the spectrum bears the same relation to Newton's plan," etc. He does not appear to have consulted Wollaston's original paper, for he says: "The spectrum seen by Wollaston was not continuous, but crossed by two dark lines parallel to the slit," whereas Wollaston states that he saw *six* lines. Curiously enough, Parkinson also says: "Two of the fixed lines, probably E and F, had been discovered by Wollaston previous to the experiments of Fraunhofer." Yet Sir David Brewster ("Optics," 1853, p. 91) says of them: "These six lines are found to correspond with those marked B, D, b, F, G and H" [by Fraunhofer].

Heath's "Geometrical Optics" (Cambridge, 1887) alludes (p. 195) to Newton's experiments with a small circular hole only, remarking (p. 196) that "the colours will not be thoroughly separated; the spectrum is then said to be impure." How a pure spectrum may be obtained is described immediately afterwards, without any reference to Newton.

I tried to draw attention to this general error by a letter which appeared in 'Nature' in October, 1882, and should hardly have referred to it again had it not been for the recurrence of the same statement in Sir William Thomson's "Popular Lectures" (vol. i, p. 324, 1889), where he says: "Newton never used a narrow beam of light, and so could not have had a homogeneous spectrum." The lecture was on "The Wave Theory of Light," and given in Philadelphia in 1884.

The weight of Sir William Thomson's name is so deservedly great that this statement by him is likely to greatly extend the prevalence of the error. The republication of the original work, now so difficult to procure for consultation, seems the best way of obviating this and other mistakes concerning it. Meanwhile I make the following extracts from the first edition (1704), in which it will be noticed that Newton used the lens also, although not to make the rays parallel.

In Prop. 4, Bk. I, of the "Opticks," 1704, Newton proposes the problem to find a pure spectrum, or, as he words it, "To separate from one another the Heterogeneous Rays of Compound Light."

After showing at some length (p. 47) why he uses a lens to "diminish the mixture of the Rays," he describes experiment 11, first with a round hole, and *afterwards with a slit*, as follows:

"In the Sun's Light, let into my darkened Chamber through a small round hole in my Window-shut, at about 10 or 12 feet from the Window, I placed a Lens, by which the image of the hole might be distinctly cast upon a sheet of white Paper, placed at the distance of six, eight, ten or twelve Feet from the Lens. For according to the difference of the Lenses I used various distances, which I think not worth the while to describe. Then immediately after the Lens I placed a Prism, by which the trajected Light might be refracted either upwards or sideways, and thereby the round image which the Lens alone did cast upon the Paper might be drawn out into a long one with Parallel Sides, as in the Third Experiment." The "oblong" image thus formed he received upon another paper placed by trial "at the just distance where the Rectilinear Sides of the Image became most distinct." In this case, he says, "the circular images of the hole extended into one another the least they could." "By using a greater or less hole in the Window-shut" he made "the Circular Images to become greater or less at pleasure," and thereby the "mixture of the Rays in the Image to be as much or as little" as he desired. "By this means," (p. 49) "I made the breadth of the image to be forty times and sometimes sixty or seventy times less than its length."

"Yet," he goes on to say (p. 49), "instead of the circular hole F *'tis better* to substitute an *oblong hole shaped like a long Parallelogram*, with its length parallel to the Prism. For if this hole be an *Inch or two long*, and but a tenth or *twentieth part of an Inch broad or narrower*, the Light of the Image will be as Simple as before or Simpler, and the Image will become much broader, and therefore more fit to have Experiments tried in its Light than before."

Instead of this "Parallelogram-hole," he says, "may be substituted a Triangular one of equal sides, whose Base, for instance, is about the tenth part of an Inch, and its height an Inch or more." The edge of the prism is, of course, placed parallel to the perpendicular of the triangle. "The Image will now be formed of Equicrural Triangles."—"These triangles are a little intermingled at their Bases but not at their Vertices," and therefore "the light where the Bases of the Triangles are is a little compounded, but on the darker side is altogether uncompounded."

He is careful in mentioning precautions to be attended to in the experiments—the exclusion of foreign light from the chamber, a good lens, a prism of large angle, "suppose of 70 degrees, and to be well wrought, being made of Glass free from Bubbles and Veins," etc.

In the above description I have italicized the breadth of the hole, the "twentieth parth of an Inch" "or narrower," because "$\frac{1}{20}$th of an inch broad" is the statement which Wollaston makes about the width of the "*crevice*" which he used when he discovered the dark lines. It is curious that Proctor should have referred to Newton's experiments with the "oblong" aperture and not have noticed that it was narrow enough to be called a "slit." Neither Newton nor Wollaston use the term slit themselves, but this term, or rather "a narrow slit," is applied in a description of Newton's experiments given in an account of Newton's optics (64 pages) published in "The Optics," issued in the "Library of Useful Knowledge" (1830). Lloyd, "Light and Vision" (1831) and "Wave Theory of Light," refers correctly to the experiments also, although he does not employ the word "slit." Where the error first crept in I have not the means of determining.

Wollaston's account of his own discovery is in a paper in the 'Philosophical Trans-

actions' for 1802, p. 378, where he says: "If a beam of daylight be admitted into a dark room by *a crevice one-twentieth of an inch broad*, and received by the eye at a distance of ten or twelve feet through a prism of flint glass *free from veins*" (italicized by Wollaston), "held near the eyes, the beam is seen to be separated into the four following colours only, red, yellowish-green, blue and violet." In a diagram accompanying the paper he notes the lines, four of which he considers as boundaries of the colours. They are six in all. Of two of them he attempts no explanation. He changed the materials of the prism, but found no alteration in the lines while he used solar light. But using candle light and the electric light he found the appearances, which, says he, "I cannot undertake to explain," different.

That Newton did not see the dark lines is very remarkable when we consider the great number and variety of his experiments. Among the causes assigned for this it is said, or implied, that Newton always received the spectrum on a screen, whereas Wollaston saw the lines by simply looking through the prism. But Newton mentions that he *looked through* the prism also (Prop. II, Bk. I, p. 22), but it was at the round hole about a quarter of an inch in diameter. If he had been using the slit on this occasion he might have anticipated Wollaston. The other chief cause assigned is that he never used a slit or lens, and did not understand the advantages of them. But, on the contrary, we see that Newton was perfectly aware of the advantages of a narrow slit. In his eleventh experiment he uses a circular hole one-tenth of an inch in diameter. After this he mentions a slit one-tenth of an inch broad, then one one-twentieth of an inch, then "narrower," and, he remarks, "the light will be as simple as before or simpler, and the image will become much broader, and therefore more fit to have experiments tried in its light than before." But he goes farther still in comparing the effects of different breadths of the slit; for in taking the long, narrow, isosceles triangular opening he makes its base the same as the diameter of the circular hole above referred to, namely, one-tenth of an inch, and its perpendicular height being an inch or more, the width of this slit tapers off from one-tenth of an inch to nothing.

II. Experimental.

While getting this paper ready for the printer I took some opportunities for repeating the experiments in which Newton used the slit and lens, as closely as possible in Newton's own manner, not expecting much from them as regards the dark lines, as I had never seen any hint given that the lines might be seen in this way, yet thinking that, with a previous knowledge of their existence, they would be visible on careful inspection, and that in the experiments as performed by Newton they might have been overlooked, because of his entrusting the division of the colours (in seeking for which Wollaston discovered these lines) chiefly to an assistant, in whose eyes he had more confidence than in his own.

Newton's method.—Newton's method, as may be seen by a comparison of different places in the "Opticks" and also by the instance he quotes in Experiment 11, was to place the lens at or about double its focal length from the aperture, by which means an image of the same size as the aperture might be received on a white paper screen about the same distance beyond the lens, then to put the prism immediately behind the lens, receive the

spectrum in the position of minimum deviation on a white paper screen and examine it. This method I followed closely, letting the light pass through the prism as near the refracting edge as possible. The sunlight was thrown on the slit by a heliostat worked by the hand (the "porte-lumière" of Duboscq). The slit was one of variable width belonging to the Duboscq collection of apparatus.

Experiments with slit and object-glasses of telescopes, etc.—I was naturally surprised to find that it was absolutely impossible to overlook the lines even when the slit was opened to the widest extent that Newton mentions. The number seen at any one time varied according to the prism or lens used or the brightness of the day, or the width of the slit, but they were always plainly visible on the spectrum. One bright day, when the width of the slit was about ¼ mm., I counted thirty-eight distinct lines, without reckoning others which were vague in outline. They were distinct enough to be visible to half a dozen persons or more at the same time. Afterwards, opening the *slit to one-tenth of an inch* (the widest used by Newton), I saw plainly ten dark lines on the white paper screen. I ought to say that I was careful always to find the exact distance at which they were best defined, but I did not take any special pains to exclude foreign light, finding that the darkness sufficient for lecture purposes was quite enough for all I wanted. I made experiments with three different prisms, viz., one by Duboscq for projection experiments, another belonging to a Duboscq spectroscope, the third was very inferior in its action to either of these. I also used three different lenses—one belonging to a Dollond telescope, of three feet six inches focal length; the second belonged also to a telescope of somewhat greater focal length; the third was simply the Duboscq lens used for projection experiments.

On seeing the results, I came to the conclusion at once that it was exceedingly improbable that they had not been published before, although I had found no mention of them in any English work that I had been able to consult (nor have I yet); nor had I found any allusion to them in Jamin's "Traite de Physique" (1881), nor in Daguin's (1862), although on re-examining this I found something like the experiments, *two* slits, however, being used. But on examining Pouillet (vol. ii, p. 208, 1853), there I found this method recommended and connected with Newton's name. In an earlier French work (Lamé, 1840) the same method is recommended, but nothing is said about Newton.

Circular hole.—In Experiment 11 Newton used a *circular hole of one-tenth of an inch* diameter. Nothing is said of experimenting with this in the above manner in any of the books I have referred to, but on examining the spectrum due to it and formed in this way I saw *four* lines very distinctly.

The above experiments, conducted after Newton's method and showing that it gave a spectrum pure enough to show as many as thirty-eight lines, were nevertheless not conducted under a condition by which Newton was restricted. I think it has been sometimes forgotten by writers on this subject that Newton had no achromatic lens, and that he could not, if he would, have made all the rays fall parallel on the prism by means of a collimating lens. In Experiment 11 he used several different lenses, as may be seen from the extract given above. The dispersion produced by any of them was probably great enough to prevent the appearance of dark lines. It seems probable that the same error which led him to despair of the construction of an achromatic lens did, as another

consequence, deprive him of the discovery of the dark lines. It was not, however, an inevitable consequence, as may be seen by making the experiment with a crown glass lens alone, as he did.

Experiment with a crown glass lens.—For this purpose I separated the parts of one of the object glasses that I had used previously, and tried further what could be done with the crown glass convex lens thus obtained. Its focal length was eighteen inches and aperture two and three-quarter inches. The results are as follows :

With the slit of one-half mm. width I counted on one occasion ten dark lines, and on others eight.

Widening the slit to *one-twentieth of an inch* (a width mentioned by Newton), I saw four lines, viz , E, b, F and G, of Fraunhofer. I noted at the time *that it was quite impossible to overlook them.*

Opening the slit still farther *to the widest extent recorded by Newton, viz., one-tenth of an inch, two lines* (F and G) *were still visible, and impossible to be overlooked.* There were also traces of others. This experiment was repeated more than once, with the same result.

Round hole—I tried also a round hole. When the diameter was one-twentieth of an inch I still could see one line (G), but with a width of one-tenth inch could see none.

The following is a summary of the conclusions arrived at :

1. That if Newton had had an achromatic lens, his method was so effective that it would have been impossible for the dark lines in the spectrum to have escaped his notice whether he used a slit or even a round hole one-tenth of an inch in diameter, without taking into account the slit one-twentieth of an inch "and narrower"

2. That even with a crown glass lens the lines must have been seen had he been ordinarily fortunate in the particular lens used.

3. That the rise of the error concerning the slit seems to have been contemporaneous with the introduction of spectrum analysis, judging from the dates given above.

VIII.—*A New Form of Ether-Oxygen Lantern.*

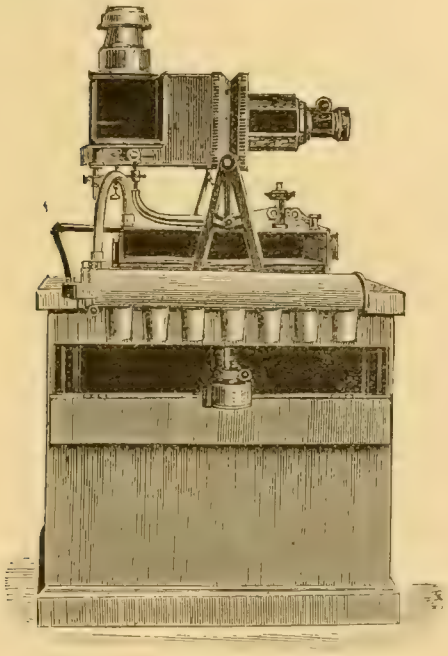
By GEORGE R. PROWSE, Montreal.

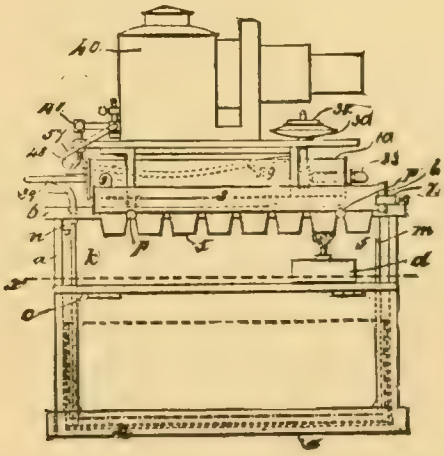
(Read May 27, 1891.)

(Communicated by Dr. A. Johnson.)

The difficulties commonly incident to the preparation and manipulation of the oxy-hydrogen light have led me, after a series of experiments extending over many years, to devise and construct a form of optical lantern which may be quickly and easily operated with the least expense and danger, and in which compactness is secured, together with an avoidance of excessive weight.

The apparatus has been designated the Ethoxycon, as indicating the use of ether and oxygen. It combines both the lantern proper and the gas generator and storage bag or receiver. In general terms, the generating and storage parts consist of a generator or retort for the production of oxygen gas, a filter or washer, a saturator, a regulator and a storage gas receiver. All of these, together with the lantern proper, are contained in a box or case which measures 10 x 18 x 18 inches. This also serves as a stand for the lantern when in use.





The details of construction and operation are as follows:

The lantern proper, or the optical part of the instrument, consists of the ordinary

lens system for enlarging, projecting and focussing the image of the object as illuminated by rays of light passing through a condenser. These parts are all comprised in a small case of wood and metal, in which is placed a four-inch condenser—this size being ample to cover the aperture of an ordinary lantern slide three inches square. The back case of the lantern is provided with a sliding adjustment to establish the proper focal relations between the lens and the condenser. The spindle upon which the lime is placed is also provided with the usual means for transverse and vertical adjustment and adjustment of the jet relatively to the lime. An important feature consists of means for vertical adjustment of the entire instrument. This is effected by having the body hung on pivots at the summit of two metal triangles. From each pivot there depends an arm carrying at its lower extremity a clamp operated by a thumb screw. This latter passes through and engages upon a short arc opening in each triangle in such a way that the body of the lantern may be adjusted horizontally, or vertically above and below this position within an extreme range of about 30°, the position desired being firmly secured by the clamping action of the thumb screws.

The generator consists of an iron or steel tube with a semi-circular cross-section. Into the flat or lower side are inserted a number of copper cups, each of a capacity to contain sufficient mixture to maintain the light for about fifteen minutes. The different rates of conduction in the two metals of the retort serve two purposes. The copper being a rapid conductor, brings about a speedy fusion of the chlorate of potash, which quickly gives off gas. The iron, by its slower conductivity, serves to retard the transmission of heat from cup to cup, thereby prevents action taking place in any cup not directly heated, and secures complete control of the whole operation. Each cup is heated in turn by means of a spirit lamp or a small Bunsen burner, as may be desired, the transfer of heat from one to the other being effected automatically by an attachment which is operated by the receiver when the gas has reached a certain degree of exhaustion.

The washer, saturator and regulator are combined in one piece, measuring 7.5 x 12.5 x 30.5 cm. This is placed directly beneath the body of the lantern between the triangular supports. The central longitudinal section is occupied by the washer. This consists of a tube arranged with fine wire cloth, and filled with a moist filtering substance, which serves to arrest any particles of carbon or other similar impurities which may pass over from the retort. On each side of the washer is a similar tube filled with pine-wood sawdust, which is charged with sulphuric or petrolic ether, as may be desired. The form of saturator is an improvement upon that usually employed, while the construction is such as to avoid all possibility of explosion. Towards one end, and directly over the washer, is a small standpipe with two stopcocks and a regulator. The latter consists of a rubber diaphragm, upon which rests a lead disc weighing about 136 grammes. The amount of gas passing through from the regulator to the burner is determined by the adjustment of two needle-point valves, one for each gas, and thus the production of a brilliant light is readily secured

The gas receiver is contained in the case which holds the entire instrument when in transport. It consists of a rubber bag, having a capacity of nearly one foot, the upper part of which is formed of a tin pan working upon two upright metal posts, one of which serves as a tube for the conveyance of gas to and from the receiver. Into the pan there is loosely fitted a second pan, designed to be filled with water in order to establish the

necessary pressure. Upon the front edge of the first pan are a number of catches designed to engage a spring and automatically transfer the source of heat from cup to cup as the pan descends during the exhaustion of the contained gas.

To place the lantern in operation the case is located in the desired position and all the moveable parts are removed. The loose pan is next filled with water to about two-thirds or three-fourths its capacity and placed in position. The rubber tube supplying gas to the receiver is next attached to its corresponding metal tube and passed through a hole in the cover made for this purpose, the latter being then closed down. Two metal rods projecting from the front of the cover are then drawn out as supports for the retort, and the lantern is placed in position on the top of the case.

Black oxide of manganese ($Mn\ O_2$) and chlorate of potash ($K\ Cl\ O_3$) in the proportions of 1 : 3 are now thoroughly crushed and mixed. If the crystals of chlorate are fine, thorough mixing with a spoon will suffice, but if large it will probably be found better and more expeditious to pass the mixture through an ordinary coffee mill. A metal trough of the form and length of the retort is now filled with the mixture, passed into the inverted retort, the whole reversed and the charger or trough withdrawn. In this process each cup will be filled and any excess of material discharged as the trough is drawn out. The head of the retort is next firmly clamped on, the retort is placed in position on its supports, and the lamp adjusted to the first cup on the right. A large rubber tube is now connected with the retort at one end and with the washer at the other, while the small tube leading from the receiver is also attached to the washer. After making certain that all connections are perfectly tight, heat is applied. If sufficient, gas will form in two and one-half minutes, the first indications of which will be in a slight action of the receiver, followed by an elevation of the regulator to its full height. The pan now rises rapidly, and, under favorable conditions, the light should be on the screen within five minutes from the first application of heat to the retort. When alcohol is used in generating the gas a somewhat longer time must be allowed for.

The distribution of the gas takes place in the following manner: As fast as it generates it passes from the retort to the washer, whence it returns by a smaller tube to the receiver, in which the surplus is stored. From the washer it also enters the standpipe and regulator, which latter determines a uniform pressure in the gas supplied to the jet, thereby securing a steady light. From this point, as regulated by the needle valves, the gas is led by two separate channels to the point of consumption. One valve transmits pure oxygen directly from the washer. The other causes a certain volume of oxygen to pass downward into one of the saturators, from which it passes into the second, and thence directly to the burner. In its course it becomes supersaturated with ether, and therefore constitutes the substitute for the ordinary hydrogen gas employed where separate gases are used.

The capacity of the retort is such that sufficient gas may be generated to operate the light continuously for about two hours. Two or more retorts will be found of advantage, and by their use continuous service may be secured for any length of time.

The exhausted charges may be speedily removed from the retort by placing the latter on end under a tap and using a free supply of water. If the latter be heated the operation will be facilitated. If not immediately needed, the retort may then be placed on end

with the mouth downward, to thoroughly drain and dry. No accumulation of moisture should be allowed, since it passes into the tubes, clogs the passage of the gas and tends to produce an unsteady light.

The washing tube should be cleaned out occasionally with fresh water to prevent clogging. The saturator needs only occasional replenishing. With due attention to these directions and the ordinary prudence which must at all times be exercised in the use of highly explosive substances, this lamp is capable of affording a brilliant and satisfactory light, with perfect safety to the operator and a minimum of expense and trouble. The cost of operating the lamp, so far as can be determined from present experience, is about fifteen cents per hour.

The apparatus is patented in Europe and America.

NOTE.

IX.—*Faraday's "Lines of Force."—Suggestion of a Name.*

By ALEXANDER JOHNSON, M.A., LL.D., Dublin, Professor of Mathematics and Natural Philosophy, McGill University, Montreal.

(Read May 27, 1891.)

It must be confessed that the introduction of a new name into science is a matter of great difficulty, but though the success of the attempt must be very doubtful, yet in the present case the need is so pressing and the confusion arising from the want of a proper term so great, that the attempt may at least incite others to the production of some term that may meet with general acceptance.

The term "lines of force" is used in two different senses, but this is not the strongest objection to it. In ordinary language, the use of the same word in two distinct meanings is often unavoidable, though always to be regretted; in the exact sciences the existence of such a term is rightly regarded as a positive blot, yet it seems to be sometimes unavoidable also. For example, we have the term "pole" in spherical geometry, in plane geometry and in physics; but this, owing to the difference of the subjects, leads to no confusion, being employed steadily in the same sense throughout any one scientific paper or investigation. On the contrary, the term "lines of force" may be used in different senses in the same page, and one of these, to the utter confusion of students, contradicts one of the fundamental notions of geometry.

The liability to error is so great that Faraday himself, who introduced the term, could not avoid the confusion. When he first employed it he defined these lines, for magnetic force, as the *curves* to which a very small magnetic needle would be a tangent, or as those which would be depicted by iron filings. He at the same time wished to use them to represent the magnetic power, "not merely in the points of quality and direction, but also in quantity." In the twenty-eighth series of his 'Experimental Researches' he says: "A point equally important to the definition of these lines is that they represent a determinate and unchanging amount of force. Though, therefore, their forms, as they exist between two or more centres or sources of magnetic power, may vary very greatly, and also the space through which they may be traced, yet the sum of power contained in any one section of a given portion of the lines is exactly equal to the sum of power in any other section of the same lines, however altered in form, or however convergent or divergent they may be at the second place." He considered that the employment of these lines would in many cases have a great advantage over the method which treated the

magnetic force "as concentrated in centres of action as the poles of magnets," or due to the diffusion of north and south magnetism as fluids.

The difficulty of distinguishing between the two senses in which he purposed to use the term was so great that in the twenty-eighth series of his 'Experimental Researches' (October, 1851) he says: "Whilst writing this paper I perceive that in the late series of these 'Researches,' Nos. 25, 26, 27, I have sometimes used the term *lines of force* so vaguely as to leave the reader doubtful whether I intended it as a merely representative idea of the forces or as the description of the path along which the power was continuously exerted." Faraday applied it to electric as well as to magnetic forces. When the originator found this difficulty, it is not wonderful that great confusion should subsequently arise in its use by others. The following is a protest from Professor Minchin in his "Statics" against the result:

"The way most in vogue with electricians for expressing the charge on one surface of a conductor is the following: Imagine all the field filled with lines of force, then the number of these that intersect the surface in the positive direction is a measure of the charge on it. A very inconvenient measure truly. Not only is this mode of speaking unjustifiable, but it is mathematically impossible to attach the slightest logical meaning to it."

Other names have been proposed for these lines of force, and for the phrase "number of lines of force." Mascart and Joubert suggest quantity or flow or flux of force as an equivalent. If F be the force at any point and dS the element of an equipotential surface drawn through the point—then if we imagine a liquid flowing through the elementary area dS, at right angles to it, with the velocity F, the expression FdS may by analogy be called the flow of force corresponding to this element. Hence, in employing a theorem of Gauss, they speak of $\int FdS$ as the flow or flux of force, or (for magnetism) of magnetic induction, proceeding from a surface S. Maxwell calls it the surface integral of magnetic induction extended over any surface.

At present there seems to be a tendency to substitute the term tubes of force, instead of lines of force, when taken in the second of the two senses. In doing this an idea of Faraday's is followed out. In a paper published in June, 1852, he spoke of the "physical existence of an atmosphere of power about a magnet," which "may be considered as disposed in *sphondyloids*, determined by the lines or rather shells of force."

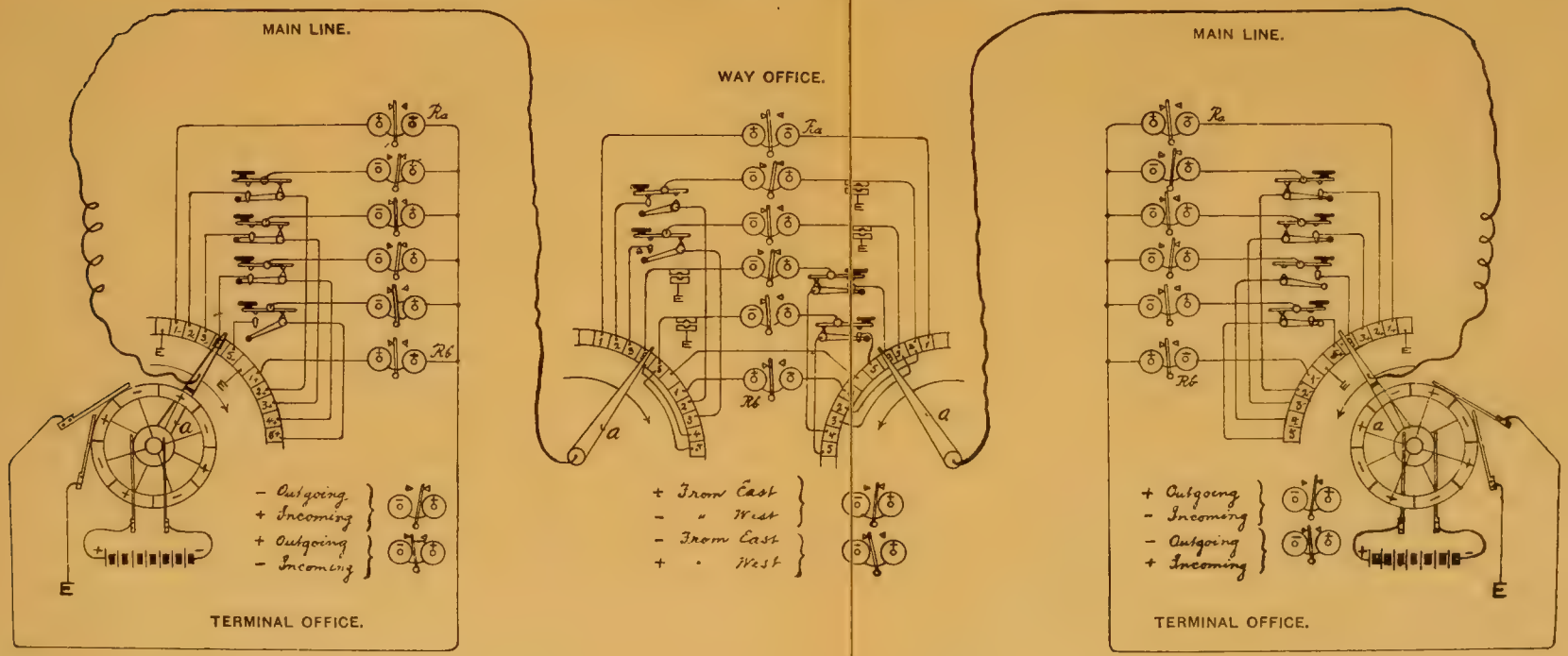
Following out this idea, if the magnetic field be divided up by equipotential surfaces, and if any curve whatever be described on any one of these and lines of force drawn through it, these lines, which are at right angles to all the equipotential surfaces, will form what is called a tube of force. If at any point where the force is F, an elementary area of equipotential surface δ is taken, such that $F\delta = 1$, we have what is termed a unit-tube. It is this term "unit-tube" which is now coming into use, instead of line, when we talk of the "number of lines of force." But no short name has, as far as I am aware, been suggested for it. It is for this reason that I would now propose a name suggested by a term of Maxwell's. Maxwell called the tubes "solenoids," but this term had already another application, and he did not himself adhere to it. In a note he gives the derivation of solenoid from the Greek word for a tube. If we are to seek for a name for a tube of force, and if the idea of the tube is to be predominant, we cannot do better than follow the scientific practice of seeking terms from the Greek—as, *e. g.*, the word

dyne, which is now generally accepted. Now, σωλην being the Greek for tube, if we give it a more English appearance by adding an *e* we have *solene*, a term which may be defined as signifying the "unit-tube of force" Thus, when indicating the distribution of force in a magnetic field, instead of speaking of the number of unit-tubes of force per square centimetre, we should speak of the number of "*solenes*" per square centimetre.

If the term should at all commend itself, it would not be difficult to bring it gradually into general use. It is not uncommon at present in text-books, in order to guard students against error, to speak of the "so-called lines of force." Now, if instead of this, "so" were put in a parenthesis before lines of force, so that it would read the "(*so*) *lines of force*," then, with the help of an explanatory foot-note, the transition to "*solenes*" only ought not apparently to be difficult. *Solene* need not necessarily be limited to unit-tubes, but it would probably be better so to keep it.

D. H. KEELEY'S

INTERCHANGEABLE WAY-WIRE MULTIPLEX SYSTEM



PLAN OF CIRCUITS SHOWING METHOD OF OPERATION.

The local circuits, discharge plates, and the adjuncts of the polarized receivers, are here omitted. The arms A, A, A, A, are revolved synchronously by motors governed by the receivers Ra, Rb, which are alternately actuated at every half revolution The main line currents are presented at both ends concurrently; + at one end and − at the other, alternately. Normally, the receivers respond to the alternations. The keys, upraised and depressed, operate to interrupt the path of one phase or the other of the current in their respective circuits. The movements of a given key are therefore reproduced in all of the receivers included in its circuit.

To illustrate Mr. F. N. Gisborne's Paper on Multiplex Telegraphy.

ROYAL SOCIETY OF CANADA

TRANSACTIONS

SECTION IV.

GEOLOGICAL AND BIOLOGICAL SCIENCES

PAPERS FOR 1891

I.—*Parka decipiens. Notes on specimens from the collections of James Reid, Esq., of Allan House, Blairgowrie, Scotland,*

By SIR WILLIAM DAWSON, LL.D., F.R.S., and PROF. PENHALLOW, B.Sc.

(Read May 28, 1891.)

PART I.—HISTORICAL AND GEOLOGICAL.

By Sir WM. DAWSON.

Last year I had the pleasure of noticing[1] some fossil plants from the Lower Devonian, kindly submitted to me by Mr. James Reid, of Allan House, Blairgowrie, Scotland. In correspondence with Mr. Reid some questions arose respecting the peculiar organisms from the same formations known as *Parka decipiens*, and Mr. Reid has been so kind as to send from his own collections and those of other friends a large number of specimens of these doubtful objects, which I have studied with much interest, and which I thought it desirable to submit to critical examination by my friend, Professor Penhallow, whose results are given in Part II. It may be useful, however, to give some preliminary account of the history and geological relations of the fossil.

Parka decipiens was originally described by Dr. Fleming in 1831.[2] This sagacious observer noted its circular groups of small rounded or polygonal, flattened, seed-like bodies, the fact of these being in part covered with a membranous involucral organ and their association with grassy-looking leaves. He regarded it as of vegetable nature, and compared it to the fruit of *Juncus* or *Sparganium*.[3] Miller agrees with this view, and in the later editions of the "Old Red Sandstone" he describes it as occurring in the quarries of Carmylie, in association with "riband-like leaves converging into a short stem," and also with "thickish wrinkled stems." These plants he compares to "stalks of sea-grass-weed plucked up by the roots," and elsewhere to "stems producing *Zostera*-like leaves." He quotes, however, the opinion of Lyell that the *Parka* may be eggs of a mollusk, and seems to lean to the belief that it may have possibly been the spawn of some of the large Devonian crustaceans associated with it in the same beds. In the seventh edition, edited by Mrs. Miller, Symonds adds a note to the effect that *Parka* is "now known to be the seeds of a plant," and is "abundant in the Kidderminster beds." In another note to the same edition the same view is given, and a specimen is figured from the collection of Lord Kinnaird, showing a peduncle apparently attached to the mass.

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[1] 'Nature,' April 10th, 1890.

[2] 'Cheek's Edinburgh Journal.'

[3] Miller, "Testimony of the Rocks."

In the sixth edition of "The Elements" Lyell figures two specimens, one of them lying in a mass of the *Zostera*-like leaves described by Fleming and Miller. He compares them with the eggs of *Natica*, and also with dried-up eggs of frogs, as observed by Mantell, but inclines to the view that they may have been ova of some species of *Pterygotus*, and states that they seem to have constituted "a single layer of ova enclosed in a sack." Mr. Powrie is referred to as holding this opinion. In "The Students' Manual," 4th edition, revised by Duncan, the same views are stated. Lyell distinguishes from *Parka* certain larger round discs, found separately and in small clusters, without any envelope, and in a letter from Mr. Powrie, kindly communicated to me, that gentleman refers to these as different from *Parka*, and also from the globular smooth objects described as *Pachytheca* by Hooker and referred to in my former note. Mr. Powrie has described the beds in Forfarshire holding these specimens, in two excellent papers in the 'Journal of the Geological Society of London,'[1] and in the latter of these he states his views as to the probable nature of *Parka*, more especially referring to the fact that numerous remains of *Pterygotus* and other crustaceans occur in the beds. It is to be observed, however, that in some of the beds vegetable remains are much more abundant than those of crustaceans.

Murchison notices the Forfarshire beds holding *Parka*, in Siluria (239 and 250 *et seq.*), referring them to the base of the Devonian, agreeing in this with Mr. Powrie in the papers above referred to. The characteristic fossiliferous beds are those known as the Arbroath flagstones. As shown in "The Geological Map of Scotland," the outcrop of these Lower Devonian beds extends in an oblique band through Forfarshire and Perthshire, and it is from this belt that most of the specimens referred to in the following pages were collected.

Page, in his "Advanced Text-book,"[2] notices *Parka*, and endeavours to solve the difficulty by figuring three specimens as respectively "vegetable," "molluscan spawn," and "crustacean spawn." The first figure represents a small specimen with remains of an indusium. The second is a larger specimen destitute of any covering. The third is a group of a few larger rounded bodies with central dot, and probably different from *Parka decipiens*, or at least from the ordinary type. He adds that he is inclined to regard many of the very numerous specimens he has studied as vegetable, but others may have been the spawn of mollusca or more probably of crustacea.

In Geikie's "Text-book of Geology" these objects are referred to as "clusters of crustacean egg-packets." A similar view is adopted by Woodward in his memoirs on *Merostomata* in the publications of the Palæontographical Society.

As stated above, the credit of directing renewed attention to these fossils belongs primarily to Mr. Reid of Allan House, Blairgowrie, and to Mr. Graham of Rescobie,[3] both of whom have collected large suites of specimens, and both were strongly impressed with their vegetable nature and with their possible affinities with rhizocarpean forms of vegetation similar to those which I had described in "The Geological History of Plants," from Ohio and from Brazil. To Mr. Reid I am indebted for placing at my disposal his large collections, and for many valuable notes as to localities, mode of occurrence and probable nature of the fossils, and to Mr. Graham for similar notes and for specimens sent through Mr. Reid.

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[1] Vol. xvii, pp. 534 *et seq.*: vol. xx, pp. 413 *et seq.*

[2] 1856, page 127.

[3] Mr. Reid in his letters also refers to Mr. MacNair as having assisted in working out stratigraphical details.

The specimens sent to me by Mr. Reid are from various parts of the Devonian belt of Perth and Forfar, ranging from Callander in the south-west to Rescobie in the north-east as well as some slabs from the Caithness flags, which Murchison regarded as of the same age with the Arbroath flags. All the specimens hold fossil plants of similar kinds; but so far as *Parka* is concerned the most important are from Myreton quarries, near Dundee and from Rescobie; the latter I believe from the collections of Mr. W. Graham of that place.

The specimens from Myreton quarries are in part gray flags containing carbonized plants; in part dark gray, hard, arenaceous shale, with flattened rugose stems, one as much as four inches in diameter, branchlets of *Psilophyton*, linear leaves and patches of *Parka*. These last are carbonized and often well preserved. They have afforded the best specimens for microscopic examination.

The specimens from Rescobie are gray and sometimes micaceous flaggy sandstone, similar to the last, with fragments of plants and patches of *Parka*, the whole flattened and carbonized or replaced by red oxide of iron. The plant remains consist of thick rugose stems, sometimes branching, and elongated leaves (*Cordaites angustifolia*), and fragments of *Psilophyton*.

Some specimens from Blairgowrie, consisting of similar gray flaggy sandstones, contain many fragments of plants, also certain seed-like and fruit-like bodies, one of which has the markings of *Parka*.

The only animal remains detected in the collection were a few fragments which may have belonged to large Merostomatous crustaceans or to placoganoid fishes. Some of these present an irregular or scaly reticulation, which might at first sight be confounded with *Parka*, but is readily distinguished on closer inspection.

The specimens of *Parka decipiens* are scattered over the surfaces of the slabs and intermixed with and sometimes apparently attached to the fragments of plants, especially the branches of the rugose stems above referred to. They are of various sizes, from half an inch to nearly two inches in diameter, and either rounded or of reniform or irregular shapes. They consist of aggregations of flattened circular or hexagonal bodies, all nearly of the same size, so that the smaller patches contain few granules and the larger a greater number. In many cases there are evident remains of a membranous indusium or covering, and several are so situated at the ends of stems as to appear to be connected with them. The covering was either originally incomplete or liable to open by dehiscence or decay, and in some cases it has disappeared altogether. In the carbonaceous specimens from Myreton the individual circular granules can be easily separated from the stone as thin pellicles of carbon, and can be mounted for microscopic study, though they are perfectly opaque. The appearance of hexagonal meshes would seem to be produced either by mutual pressure in flattening or by the compression between them of some soft substance filling their interstices. They were probably originally globular, but must have been soft and compressible, and probably only in one layer, and not in a globular mass or berry-like form. The apparent indusium may either have been a sac-like covering or a frond to which a layer of globules was attached. The greater part of the flattened discs are, to the naked eye, perfectly smooth; but a few show slight prominences or pustules, which may indicate small and dense globules enclosed in the individual disc or granule.

With reference to the disputed question as to the nature of these bodies, it is evident

that they may either have been ova or spawn of some animal deposited in patches on fronds or stems of aquatic plants, and with or without an investing sac, or they may have been groups of sporocarps, covered or partially covered with an indusium, and borne on somewhat thick, fleshy stems.

In the former case they could not have been deposited in sand, like the eggs of *Natica*, or in masses like the spawn of frogs; but they may have been the ova either of gastropod mollusks or of crustaceans depositing their eggs in flat patches on vegetable or other bodies in water. The variable size and form of the patches may be regarded as so far corresponding with this view of their origin.

If of vegetable origin they would probably be the sporocarps of some cryptogamous plant of aquatic habitat rather than seeds of phaenogamous plants. On this supposition the various forms and sizes might be explained by supposing different species or varieties or accidental differences of preservation.

It was evident that these questions could be best settled by microscopic examination, which I could not learn had been undertaken, except by Mr. Powrie, who states in a letter communicated to me that he has examined specimens microscopically without any result. None of the specimens on the flags seemed in a condition to afford structure, but those on the shales from Myreton seemed more promising. Having removed some of the flat pellicles of these specimens, I found that, though extremely thin, they were perfectly opaque, and by attempting to rub them down I merely succeeded in finding that they consisted of three extremely thin layers, the two outer black and carbonaceous, the inner amber-coloured and translucent. As opaque objects, however, the best specimens showed a *hexagonal cellular areolation*, and on comparing this with the surface of sporocarps of *Protosalvinia* from Ohio and Brazil, I found the structures perfectly similar. This was so far an indication of vegetable affinity, as I know of no crustacean or molluscan ova showing such cellular areolation. Finally, having removed a few of the discs from the matrix, these were boiled for some time in nitric acid, by which the outer coat was in part removed, and the interior was softened and caused to swell. In this condition, when broken up and examined in water, the middle layer resolved itself into what seemed to be a mass of microspores, which were easily separated, though some of them seemed inclined to adhere in stellar groups, or, as Prof. Penhallow subsequently made out, to be connected with groups of thin-walled cells. These microspores are of a delicate yellow colour, thin-walled, and in some cases showing a triangular mark similar to that on spores of *Isoetes*, etc. These results seemed sufficiently to settle the vegetable nature of *Parka* and its probable relation to the sporocarps of *Protosalvinia* of the Erian of America.

At this stage of the investigation I thought it well to call in the technical skill and experience of my friend, Prof. Penhallow, that I might have his independent judgment in the matter. Prof. Penhallow was so kind as to submit the specimens to careful microscopical examination, and has furnished me with the results so fully and clearly detailed in the second part of this paper.

Two questions still remain. Are all the organisms referred to *Parka* of the same nature; and to which, if any, of the plants associated with it does it belong?

As to the first question, the specimens experimented upon were of the ordinary form, in a hexagonal areolation, and constitute patches enclosed wholly or partially in an indusium. They are perfectly similar to all the numerous specimens in the Rescobie and

Myreton collections. They differ, however, entirely in structure from *Pachytheca*, which is found in the same beds, but retaining its rotundity of form (while *Parka* is flattened), and showing no cellular areolation. Nor is there anything to connect *Parka* with certain rounded and ovate vesicles of larger size found detached in the same beds, and which have been noticed by Mr. Powrie and Mr. Reid. These are not improbably vegetable, and possibly sporocarps or indusia, but I have not found them to show any structure.

With reference to the second question, we cannot connect these bodies with *Psilophyton*, whose fructification is well known, and the only other plants on the slabs are the rugose stems above referred to and the narrow *Zostera*-like leaves which would seem to have constituted their foliage. These plants occur both in the Rescobie and Myreton specimens on the same slabs with *Parka*. In carefully examining the slabs I find a number of masses of *Parka* placed at the extremities of branches or fragments of branches of these rugose stems. This apposition may be accidental, but it occurs so frequently as to give some probability that it indicates an organic connection.

Putting the parts together in accordance with these facts, we may suppose *Parka decipiens* to be the fruit of an aquatic plant having strong rugose but not woody stems or rhozomes, producing numerous branches, those which were fertile, and perhaps nearer the base, supporting clusters of *Parka*, those which were barren producing long grass-like floating leaves like those of *Zostera*. The affinities of such a plant would be with modern rhizocarps, though a peculiar and exaggerated form.

In the meantime *Parka decipiens* may be accepted as an addition to the vastly profuse rhizocarpean flora, which we know from American examples to have been present in the waters of the Devonian period, as the author has shown in previous publications.[1] It seems possible that the plant formerly described by the author as *Cordaites angustifolia*,[2] from the Erian of Gaspé may be allied to *Parka*, though only its leaves and stems are known. Many rugose stems similar to the Scottish specimens have been noticed in both the Lower and Upper Erian of Gaspé and the Baie des Chaleurs, and in both localities patches of compressed vesicles larger than those of *Parka*, and in dense, closely packed masses, have been found associated with these; and at Gaspé I found, in 1868, a group of vesicles similar to the Scottish specimens, but smaller. It is, therefore, probable that forms of this kind existed on both sides of the Atlantic in the early Devonian.

It is further to be observed that as we know the sporocarps of *Protosalvinia* of Ohio and of Brazil only as detached individuals, we cannot be certain that these may not originally have been attached together in groups like *Parka*, and we do not yet know with certainty the nature of their vegetative organs. In the meantime the facts above stated should serve to guide investigation with respect to these interesting plants on both sides of the Atlantic.

It is proper to state that these new developments add to the evidence to which I have referred in my papers on *Protosalvinia*,[3] and in "The Geological History of Plants,"[4] in favour of the great development of the rhizocarpean type in Palæozoic times. The enormous quantities of sporocarps and macrospores in the Upper Erian shales of Ohio and

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[1] "Geological History of Plants," p. 48 *et seq.*; 'Transactions Chicago Academy,' vol. i, No. 9, 1886.

[2] I do not now regard the Gaspé plant as of this species.

[3] 'Canadian Record of Science,' 1883; 'Bul. Chicago Academy,' 1886, p. 105.

[4] 1888, London and New York.

Western Canada testify to this in the later Devonian of America, and the Lower Devonian *Parka* affords similar evidence. There is, as I have elsewhere maintained, the best reason to believe that organisms of this kind were also very important in the Carboniferous period, and that many of the sporocarps and macrospores found in the shales, cannels and bituminous coals will prove to be rhizocarpean. In this connection I may also refer to such organisms as *Sporocystis* and *Lepidocystis* of Lesquereux, from the coal-formation of Pennsylvania, and which, on the evidence of specimens kindly sent to me by Mr. Lacoe of Pittston, Pa., I am inclined to regard as near allies of *Parka*.

The probable relation of *Parka* with the obscure rugose stems, *Zostera*-like leaves, etc., associated with it in Scotland, also serves to afford at least a conjectural explanation of the quantities of vegetable *débris* of this kind found in the Erian in Europe and America, and also in some still older formations, and which have variously been referred to *Algæ*, stipes of ferns, fragments of Lycopodaceous plants, etc. *Parka* and *Protosalvinia* also come into connection with *Psilophyton*, *Ptilophyton*, *Arthrostigma* and other plants of the Erian, which have been regarded as intermediate between *Rhizocarps* and *Lycopods*.

All these facts place us in presence of a vast development of rhizocarpean forms as forerunners of the abundant and gigantic lycopodiaceous plants and ferns of the latter Palæozoic, and show that these humble aquatic plants once played a much more important part in nature than one could have inferred from their degraded position in modern times.

It is due to that gifted observer, the late Sir W. E. Logan, to recall the fact that his recognition in 1863 of the occurrence of shales filled with "microscopic orbicular bodies" in the Upper Erian of Kettle Point, Lake Huron, described by me, in 1871, as *Sporangites Huronensis*, was the first intimation given to the world of the vast deposits of this kind in the Erian of interior America. Another sagacious and acute observer, the late Dr. Fleming, discovered and described *Parka decipiens* in the Devonian of Scotland, and suggested its vegetable nature, as far back as 1831; while Miller in later years followed up the research and kept these obscure fossils before men's minds as probably aquatic plants. In geology it is the men who note and record small and apparently obscure facts who often open the door to wide and important generalizations. Fleming I knew as an aged man when I was a student. Logan and Miller were friends in later years. It is a pleasure to be able to continue and extend their work.

Parka decipiens. Notes on specimens of collections, etc.—(Continued.)

Part II.—Microscopical and Botanical Results.

(With Plate I)

By D. P. Penhallow, B.Sc.

Early in the winter of 1890-91, Sir William Dawson placed in my hands certain specimens of *Parka decipiens*, with the request that I should make a microscopical examination of it. The material was originally obtained from Mr. James Reid of Blairgowrie, Scotland, and consisted of gray and micaceous sandstone bearing impressions of *Parka*, together with a number of the *Parka* discs which had been boiled out in nitric acid. After careful examination and comparison, the conclusion was reached that *Parka* was an aquatic rhizocarp, probably allied to *Pilularia*. Since then a large amount of correspondence on the subject has passed between Mr. Reid, Mr. Graham and Sir William Dawson, and we have also received from the first named gentleman a large amount of fresh material, together with the results of more recent observations made at the various localities where *Parka* is found in abundance. Some of this additional material throws light upon hitherto obscure points, while many of the suggestions offered by Mr. Reid and Mr. Graham are of considerable importance as bearing upon the views entertained by Sir William Dawson and myself.

In consideration of these facts, it has seemed desirable to carefully review the whole subject from the double standpoint of the data furnished by the two gentlemen referred to and the evidence of the specimens as brought under my own inspection. It seems the more important to do this since the question of the animal origin of these fossils, raised some years since, has not, up to the present time, been wholly disposed of.

The origin of the specimens, their geology and history have been fully considered by Sir William Dawson in the preceding pages, and it therefore devolves upon me to consider them botanically, upon the basis of microscopical examination of the various parts.

Preliminary to such an enquiry, it has been found desirable to classify the material in a general way, without reference to locality. All the specimens so far examined thus naturally fall into the following groups:

1. Rugose stems, in which the organic matter has been wholly replaced by red oxide of iron. Many fragments of these show little in detail, though all agree in general characteristics. The most perfect is 36 cm. long, 45 cm. wide at the lower end and 3 cm. broad at the upper end. Three branches, alternate and opposite (?), are distant from one

another about 11 cm., and are for the most part 1 to 2 cm. broad. No superficial structure is apparent. The plant represented by this fossil was evidently not highly vascular, and readily compressible.

2. Rugose stems represented by a specimen about 16 cm. long, 4 mm. in diameter, and showing leaves apparently attached, 2 mm. broad.

3. Fragments of linear leaves (*Cordaites augustifolia?*). These are 1 cm. broad, and show somewhat rounding terminations. Carbonaceous residue is somewhat conspicuous.

4. Linear leaves or branches. These are usually represented by mere impressions, and measure from 1 to 3 mm. in width, the average width being 2 mm. They usually show no structure, but in a few cases fine, parallel lines like the nerves of a linear leaf are to be seen.

5. Oval impressions showing distinct reticulations. Three such impressions have been observed. The most perfect is an oval body 13 × 20 mm. and devoid of *Parka* discs, but showing a reticulated and somewhat radiating structure, evidently composed of elongated parenchymatous cells. The form of this specimen appears to be quite complete. The second impression is that of a body similar in size, form and structural markings, but only one-half is in view. The third is of the same nature, but the structural markings are more obscure.

6. Discoid impressions of bodies represented by a somewhat carbonaceous residue, but showing no structure. Apparently solid, spore-like spheres flattened by pressure. Three such discs have been observed, one measuring 6 mm. broad, and the other two 5 mm. each.

7. Various fragments of *Parka* of different dimensions and various degrees of perfection. These all show the characteristic discs or hexagonal markings, which are sometimes carbonized, so that they may be separated. They are more generally mere impressions. For convenience they may be separated, according to variations in size, into groups A, B and C.

Group A.—Bodies of usually regular outline, and oval or round, with distinct discoid markings. They measure from 6 to 11 mm. in breadth. These are associated with stems, to which they sometimes appear united.

Group B.—Oval bodies with *Parka* markings distinct, and not in any way connected with stems. The outline is generally perfect. They measure about 13 × 20 mm.

Group C.—A large oval body of ferruginous character, with fairly well preserved outline and impressions of *Parka* discs. It measures 3·5 cm. by 5·3 cm.

Numerous fragments showing well-defined *Parka* discs occur, and, from their size, appear to be parts of bodies of the above dimensions. To properly understand the relations of these various bodies a detailed consideration of each is essential.

The Rugose Stems, 1 and 2.—Of the rugose stems only two fairly perfect specimens have been brought under my notice; the one relatively large, and the other relatively small. All the other stem specimens are mere fragments which exhibit no special details. The larger stem is completely flattened, and all the organic matter has been replaced by red oxide of iron. One end—the inferior—is distinctly broader than the other—the superior—the diameter of each being 4·5 cm. and 3 cm. respectively. Three branches, as

represented by their short stumps, are given off at intervals of about 11 cm. Apparently they are alternate and opposite in arrangement, but this may be the result of displacement. The union of these branches with the main axis is not abrupt—*i.e.*, at right angles—but the separation is gradual, as we find in the lateral members of many aquatic plants having horizontal stems, thus suggesting possible similarity of organisms. And if this idea were extended, it would be quite possible to show a somewhat well defined general resemblance to such horizontal stems as are found in *Marsilia* and *Pilularia*.

No leaves *in situ* have been found, and it is therefore impossible to decide, except so far as the very limited value of association may afford testimony, as to the character of the foliage produced by this stem. A careful search has also failed to disclose any attachments having the nature of inflorescence or fruit.

That the stem was not highly vascular would seem to be indicated by the extreme compression which it has suffered, and, so far as it goes in connection with what has already been stated, this might also be taken as evidence of the possibly aquatic character of the plant. In a recent communication from Mr. Reid he expresses a similar view.

Fragments of Leaves, Nos. 3 and 4.—Associated with the large stems are portions of linear leaves. They are generally about 4 to 6 cm. long, and have a uniform width of 1 cm. They show one end broken off, and the other somewhat rounded. The carbonaceous substance is sometimes conspicuous, sometimes replaced by red oxide of iron. No superficial markings are to be seen. These remains are referred to in the present paper by Sir William Dawson as *Cordaites augustifolia*, from their general resemblance to the leaves of that plant, but without any intention of establishing identity between the two. There is no direct evidence to show what these leaves were derived from.

The greater number of the specimens examined show impressions or carbonaceous remains of long, linear bodies, either slender stems or narrow leaves. They vary in width from 1 to 3 mm., but show a general tendency towards an average width of 2 mm. As a rule no structure is apparent, though in a few cases fine parallel markings have been observed, suggesting similarity to the nerves of a linear leaf. No terminations of these organs have been found, though in the smaller stem—No. 2—the two lateral members appear to be the same as these organs. It would, therefore, seem highly probable that these remains represent linear leaves belonging to horizontal stems of the dimensions and character of the smaller stems already described.

The larger leaves (*Cordaites*) cannot be definitely connected with any stem, but the constancy of their association with the large rugose stems, with which the narrower leaves do not appear to be found, and their close similarity to the latter, would seem to suggest that they are in reality the foliage of those stems. In this connection it may also be well to point out the fact that in his visits to the quarries where *Parka* is found, Mr. Graham "got bits of riband-leaves, narrow stalks and associated *Parka*, the latter in comparative abundance, and *nothing else*."

As pointed out by Sir William Dawson, remains of *Psilophyton* are very numerous in connection with *Parka*, being represented both by stems and fragments of leaves. It is, therefore, quite possible that some of the narrow leaves referred to above as belonging to *Parka* may in reality belong to *Psilophyton*, though I think it hardly probable. On the other hand, one specimen from Caithness, Scotland, received from Mr. Reid, shows a tuft

of long narrow leaves apparently attached to a creeping stem. The whole tuft is 16 cm. long, 6 cm. broad at the upper extremity, and 5 cm. broad at the lower end, where all the leaves appear to be attached to a horizontal stem about 1 cm. in diameter. This part of the specimen is rather obscure, however, and too much importance must not be attached to it. The leaves in width and other characteristics closely approach those of the narrower form described above.

Oval Bodies, No. 5.—Three impressions—one tolerably complete and the other two fragmentary—have been found, showing oval bodies with a reticulated and radiating structure. They show no trace of organic matter, and are as a rule devoid of *Parka* discs. In the complete form they measure 13 × 20 mm., and show evidence of a cellular structure, which is distinctly radiating and composed of elongated cells. The general structure is similar to that observed in the sporangia of rhizocarps. In one case impressions of *Parka* discs were found near the edge and clearly *within* the limits of the body. This may, of course, be a purely accidental association. In the same case a discoid body, 5 mm. in diameter (Plate I, fig. 6), but devoid of structural markings, was found near the margin, and in all three specimens *Parka* discs were found scattered through the matrix in various directions.

In the case of the most perfect one there were also associated with it in close proximity two oval bodies; one (fig. 3) containing eleven *Parka* discs, and the other and smaller five discs.

The impression gained by the size, form and structure of these bodies is that they probably represent the entire (or portions of) sporocarps in which the *Parka* discs were contained, a view which gains a certain measure of support from the peculiar association of these bodies with one another.

Discoid Bodies, No. 6.—In three instances I observed round discoid bodies having a diameter of 6 mm. in one case and of 5 mm. in each of the others. These objects are more or less carbonized, but less so than many of the *Parka* discs. They are usually of well-preserved outline, somewhat more strongly elevated at the centre, as if there were a harder body enclosed, which more fully resisted the action of pressure. They show no structural markings. (Plate I, fig. 6.) The concentric lines shown in the figure are probably the result of compression. These bodies are so distinctly different from anything else found in the material under consideration, that it is not possible at present to establish their connection. It might be urged that they are young sporocarps of the same nature as those so commonly found in *Parka*, but if we grant this view we must admit a remarkable uniformity in the state of development of all that have so far been found. On the other hand, they are most certainly not isolated *Parka* discs, from which they are conspicuously different both in form and size. These bodies have been noted by both Mr. Powrie and Mr. Reid. The only other fossils with which they are more or less comparable is *Pachytheca*, which occurs in the same beds, but the differences are such that it seems hardly possible to connect the two.

I should, therefore, be inclined for the present to regard them as sporangia representing a fruit similar to that which occurs in *Psilotum*, and I find that in his most recent communication to Sir William Dawson Mr. Reid also advances the same idea.

PARKA DECIPIENS, No. 7.—The structures about which the interest of this present inquiry primarily centres, and those to which the name of *Parka decipiens* was in the first instance assigned, are represented by rounded or oval discs in various states of preservation and variously aggregated. Frequently these discs consist of carbonaceous bodies, which may be separated from the matrix and which show definite structure. At other times they appear as mere impressions, the mass showing hexagonal depressions as produced by the closely aggregated bodies originally present.

These discs are in a few cases scattered separately through the matrix, but they are more commonly aggregated in oval masses of variable size, the whole sometimes presenting evidence of having had a special covering. A comparison of these masses shows that there are differences in point of size, which render it desirable to consider them as falling in three distinct groups.

Group A.—The masses included in this group are usually of more or less regular outline, oval in form and with regular discoid markings. They measure 6 to 11 mm. in diameter. There are also similar bodies containing *Parka* discs, but somewhat smaller, measuring 5 mm. in diameter. One of these is shown in fig. 3, from which it appears obvious, as shown by the imperfectly rounded and massed *Parka* discs, that they are imperfectly developed forms of the larger but otherwise similar bodies.

Group B.—In this group may be included similar oval bodies bearing an abundance of *Parka* discs, usually of regular and well-defined outline, and measuring about 13 × 20 mm. They are, therefore, decidedly larger than the preceding. These show occasional evidence of an outer covering, but in no case have I seen a stem to which they are terminal. They are associated with the bodies of the Group A, and therefore with the same leaves and stems. The discs in these masses are usually carbonized, though they are frequently represented by mere impressions.

These bodies are common, and are found associated with the small stems, with the narrow linear leaves, and with the empty sporocraps already described. In two cases there was an apparent stem. (Plate I, fig. 5.) Whether this relation is accidental or normal cannot be fully determined from our specimens. Also, as shown in the same figure, there is very strong evidence that an outer covering has been removed by pressure from the main body, thus allowing the escape of all but five of the enclosed bodies, of which only mere impressions can be seen.

Group C.—This embraces nearly complete oval bodies of large dimensions and fragments of masses evidently of the same or nearly the same size. They are all obviously larger than those included in the preceding group. Taking the most complete specimen as a representative, they are found to measure 3·5 × 5·3 cm. They are associated with the large rugose stems, and, like them, the carbonaceous matter is wholly replaced by red oxide of iron in the more complete specimens. The fragments show carbonized *Parka* discs or else mere impressions. Plate I, fig. 4, shows a portion of a characteristic mass with carbonized discs. Associated with these larger masses are the broad linear leaves (*Cordaites*), and also to some extent the narrow leaves.

From the foregoing comparisons it would appear that we have to deal with bodies of a similar nature structurally, but differing materially in point of size. It might be suggested that such variation represents different conditions of maturity, but a little

reflection will show that such a view can hardly be entertained, and for the following reasons:

1st. In all of the masses, except the smallest and obviously immature ones, the *Parka* discs are well rounded and distinct, showing evident maturity.

2nd. While in any individual mass there is a certain amount of variation in the contained discs, there is constancy of dimension as between the discs of the various masses.

3rd. The difference in size shown to exist between these masses is not a graduated one, but, as is evident from the dimensions given, is a clearly defined one, by reason of which three separate groups are recognizable. This was, in fact, recognized by Mr. Reid, who pointed out in one of his communications the presence of bodies of two dimensions at least, while Mr. Graham suggests that such a plant might have occurred in a number of forms.

It would thus seem clear that in these masses and oval bodies we must recognize sporocarps containing globular sporangia (*Parka* discs). As to the insertion of these sporangia on the main axis, a question is raised here which it is not at all easy to decide. Two at least of our specimens show a stalk to which the sporocarps are terminal, but the relation is not altogether such as to establish the connection beyond reasonable doubt. Mr. Reid adopts the view of a distinct stalk, and makes his restoration of the plant accordingly. This view is justified by comparison with *Marsilia*, but is not justified by comparison with *Pilularia*, though there is no good reason for rejecting the view that an ancient *Pilularia* may have had stalked sporocarps. On the other hand, it must be kept in mind that these bodies appear, for the most part, quite independent of stems of any kind, and even when such association does occur, as pointed out by Mr. Graham, the masses are generally lateral to and sessile upon the stems. The weight of evidence would thus seem to point to the fact that these sporocarps are sessile upon horizontal stems, such as are represented by the associated structures, and in this respect the plant must be regarded as having affinities with *Pilularia*.

This brings us to a consideration of the character and structure of the discs as sporangia. As already shown, only a few of the masses show carbonized discs which can be removed. Some of these were carefully boiled out in nitric acid by Sir William Dawson, and handed to me for microscopical examination. Most of them were found to be practically unaltered by this treatment, and were totally opaque. A few, however, broke up or had their outer covering so far removed as to render the internal structure apparent. It was obvious from the outset that each disc was invested by a thick carbonaceous layer, in which no structure could be detected, except when examined as an opaque object, when, as Sir William Dawson has pointed out, a reticulation of the surface is to be observed, similar to that which characterizes the membranes of many sporocarps of modern rhizocarpian plants. Internal to this, however, the disc was observed to consist of a distinct tissue, composed of rather thin-walled cells, thus giving direct proof that they were not simple spores, but of the nature of sporangia. In one or two cases they also appeared to contain certain rounded bodies similar to spores, at least distinct from the other parts of the structure, but so involved as to leave their identity somewhat in doubt.

A careful search through the entire material disclosed numerous detached bodies of rounded or oval form, consisting of a transparent or translucent body, to which were attached the carbonized remains of what I took to be an outer and highly differentiated

cell-wall. These bodies are represented in fig. 2 b, the figures given having been taken as fair average examples of all those found. As the result of an examination of the material first submitted to me, I came to the conclusion that these bodies have an average diameter of 34·6 μ., but that sufficient allowance for the thickness of a cell-wall, as represented by the carbonaceous investment, would make their original dimensions approximate to 40 μ. Later and more extended measurements confirm this result. Comparing with modern types, I find these bodies to be a little larger than the spores of *Lycopodium* (34 μ.), much larger than the microspores of *Selaginella* (28 μ.), and small as compared with the macrospores of extinct *Protosalvania* or modern rhizocarps.

There were also found two small oval cells (fig. 2 *a*) possessing the remains of an outer cell-wall as a carbonized crust. They measured 15 μ. in diameter. No other similar bodies were found. This might be due to their more perishable nature. Both of these bodies are evidently of the nature of spores, and it would seem justifiable to regard them as macrospores and microspores, a view justified by their difference in size, state of preservation and relative number. This would therefore show that both kinds of spores were produced in the same sporocarp as in *Marsilia* and *Pilularia*.

An additional fact of very considerable importance seems to be well established by the material examined. In the slides prepared by Sir William Dawson, who specially drew my attention to them, there are found a large number of rather curious, apparently stellate bodies of complex structure. Sir William Dawson seemed inclined to regard them as remnants of spore clusters. My own impression, as I first examined them, was that they represented the walls of empty sporangia. Upon more critical examination, and after an inspection of additional material, it became evident that neither view could be maintained.

It was found that each body (fig. 1) contained a central carbonized mass, probably the remains of a more highly cutinized structure, about which were disposed cells of very variable form and size, often showing a more or less distinctly radial disposition. Careful focussing also showed that the smaller ones (*f*) were spherical, while the larger (*a*) were nearly or quite flat. An examination of all I could find showed that there was a total absence of constancy in size and structural detail; and if sporangia, this variation could only be accounted for on the ground of different degrees of development, a condition most unlikely to be found among sporangia from the same sporocarp. Their diminutive size as compared with the *Parka* discs (sporangia) would also be opposed to this.

In fig. 1, comparing the series of figures, it will be seen that from *f* to *a* there is evident a more or less gradual development. These figures were taken without special selection as examples of the many structures of this kind found, while several similar bodies much larger than *a* were also observed. The possible connection between fig. 1 *f* and fig. 2 *b* is somewhat obvious. If we regard *f* as a developing condition of *b*, and that from *f* to *a* we have different stages of growth in similar bodies, I think the relation is made clear. This would, therefore, make the bodies *a*, *b*, *c*, *d*, *e*, *f* prothalli in different stages of growth, a view which is well supported by their form and structure.

The data thus gathered seems to strongly indicate that *Parka* is an aquatic rhizocarp allied to *Pilularia*. In the earlier part of the correspondence on this subject Mr. Reid inclined to this view, but later thought there were possible affinities with *Marsilia*. I think we may consider, however, that the narrow leaves, the sessile fruit and the composition of the sporocarps make the relation much nearer the former than the latter.

But, as shown by the specimens, there are undoubtedly three forms to be distinguished. As some means of separating them seems desirable, I would suggest that they be referred to one species and two varieties, the latter being converted into species, if found desirable, on the basis of future examinations of such new material as may be available. The larger forms with the rugose stems and large oval fruit would properly constitute the type *Parka decipiens*, Flem. The fruits of the second dimension are the representatives of the first varietal form *α media*, and the smaller fruits and stems, together with the narrow linear leaves, would be *β minor*.

The systematic description of these plants as thus developed might be stated as follows :

Genus Parka. Flem.

Aquatic plants with creeping stems, linear leaves, and sessile sporocarps bearing two kinds of sporangia. Sporangia, 2 mm. in diameter ; macrospores, 40 μ ; microspores, 15 μ.

These fossils occur in micaceous, slaty or sandy shales. Their most characteristic appearance is that of oval bodies or fragmentary masses showing rounded discs or impressions of such. They are sometimes carbonized, often ferruginous. From the Lower Devonian of Myreton, Rescobie, Blairgowrie, Thurso and Caithness, Scotland. (Reid and Graham.)

Parka decipiens, Flem.—Stems rugose, about 4 cm. in diameter, showing stumps of branches about 11 cm. distant. Leaves linear, 1 cm. broad, with somewhat rounded terminations. Sporocarps oval, 3·5 × 5·5 cm., bearing more or less conspicuous impressions of the contained sporangia.

The sporocarps are sometimes complete, though generally found in fragments, either carbonized or ferruginous.

α media, n. var. Sporocarps oval, nearly entire, 13 × 20 mm. broad. Impressions of sporangia distinct, usually carbonized.

This variety shows no conspicuous leaves or stems.

β minor, n. var. Stems 4 mm. broad. Leaves linear, 1·5 to 2 mm. broad, sometimes finely veined. Sporocarps oval, 6 to 11 mm. broad. Impressions of the sporangia distinct, often carbonized.

EXPLANATION OF PLATE I.

Fig. 1.—Prothalli in various stages of growth. *a* The most complete form, flat and thalloid. *f* In an early stage of growth from the spore and spherical. × 300.

2*a*.—Microspores showing the cell-wall carbonized. × 300.

2*b*.—Macrospores showing the cell-wall carbonized. × 300.

3.—Sporocarp showing the contained sporangia in an undeveloped state. × 4·2.

4.—Portion of a large sporocarp of *Parka decipiens*, showing the characteristic form and aggregation of the sporangia × 5·3.

5.—Sporocarp of variety *α media*, showing the outer membrane crushed off at the top, and five sporangia in the depleted cavity. × 4·2.

6.—Discoid body resembling the fruit of *Psilotum*. × 4.

7.—*Parka decipiens*, Flem., var. *β minor*, Pen. Natural size.

II.—*On the Present State of Botany in Canada, with suggestions as to promising lines of investigation, and a proposal for united effort in systematic observation throughout the several Provinces and Territories.*

By GEORGE LAWSON, PhD., LL.D., F.I.C.

(Read May 27, 1891.)

At the present time, botanical research in Canada depends largely upon voluntary service. Even the teaching of Botany of our colleges and universities is left too much to professors overburdened with other duties. The work of research may be allocated to distinct departments. First, we have the investigation of the minute structure of the plant, the forms and modifications of its tissue elements, their modes of development, and, generally, those phenomena that are directly traceable to the action in the living plant of the granular semi-fluid which Hugo von Mohl, nearly sixty years ago, called "protoplasm," and was content to regard as simply primordial organic substance concerned in the processes of cell-development.

Research in this department requires careful training on the part of the student in the use of the microscope and its adjuncts, in stainings and other methods now commonly employed to cause the tissue elements to reveal their intimate textures, and in the application of chemical tests to disclose the successive changes in the nature of the cell contents, of the compounds associated with and separable from the protoplasm in the processes of growth, and of the various substances that become secreted or separated from the ordinary active cell-sap, and collect, either in special receptacular cells, or in intercellular glandular cavities, or are poured out on the surface.

We have also the study of plant organs, formed by the association and union of the tissues into anatomical forms, the physiological actions of such organs, and, specially, the effects of heat, light, moisture, soil-constituents, and other external agencies in relation thereto, as well as on the plant's activities in general.

Notwithstanding all that has already been done, there is still ample room for research in regard to the process of assimilation, or appropriation of inorganic matter, and its transformation into organic substance,—two obviously distinct processes that cannot, with our present knowledge, be clearly separated.

The series of changes which the organic matter once formed afterwards undergoes, that is, its subsequent transmutation or metastasis, now known as metabolism, whereby new and remarkable compounds are produced, is a subject of no less interest, either from a physiological or chemical point of view ; and, inasmuch as its effective study is so recent, it offers a fertile field in which only detached patches have been cultivated.

The subject of the movements of plants, or rather of their organs, needs only to be mentioned to recall observations already recorded suggestive of the interest pertaining to many that still remain to be made.

As regards the remarkably multifarious, yet correlative, processes of reproduction in the vegetable kingdom, their phenomena have been steadily under investigation, with constantly increasing improvement of apparatus and appliances, for half a century, and the interest and wealth of results only increase with the years.

Investigation of the subjects to which I have thus briefly alluded can be undertaken, with reasonable prospect of success, only by those who have enjoyed preliminary training in the more recent modes of investigation, and in the use of the varied forms of apparatus that have been designed to enable observations and experiments to be made with the nearest possible approach to precision. Fortunately, the efforts of our higher educational institutions, not only the universities and professional schools, but high schools and academies, and also some of our agricultural establishments, colleges and experimental stations, are now being put forth, with fair show of success, to meet the wants of botanical students. Where even a preliminary training only in manipulation is obtained, zeal, energy and perseverance may do the rest.

From what has been stated, it will be obvious that efforts to extend our knowledge in the departments enumerated will depend to a very large extent upon the practical laboratory teaching at the universities and other public institutions throughout the several provinces. Where this is provided researches will be undertaken by special and graduate students. This kind of university work is the crowning fruit of his teaching that rewards a professor's labours. Every effort should be made to encourage such students to continue their work after leaving college, otherwise the labour spent in college, while of educational value to the individual, may be lost so far as the interests of science are concerned. This remark may not be thought entirely out of place when I mention that a friend told me within the last few days that on a recent revisit to Germany, Dr. Strasburger, the well-known vegetable physiologist, in whose laboratory he had worked in former years, expressed, not his delight only, but his surprise, that his American pupil had really continued to go on with his microscopical work after returning to his American home.

What I have said in regard to research in the minute anatomy and physiology of plants generally will apply, to a large extent, to an allied department of a still more special character, viz., fossil botany, which, through the indefatigable labours and admirable researches extending over so many years of Sir William Dawson and latterly of Dr. Penhallow, has been so prominent in the publications of the Royal Society of Canada as to command attention to our publication wherever the subject is studied, and attention to the subject wherever our publication reaches.

After receiving proper training in methods of observation and in the mechanical processes of preparing specimens, the physiological and the palæontological botanists may continue to pursue their work at home almost single-handed. It is not so with the systematic or species botanist. He is continually in need of the assistance of others in multifarious ways, and, whether monographing a family, investigating the relations of a puzzling species, or tabulating facts for a speculation in geographical botany, he must have constant recourse to the observations, collections, libraries and advice of others.

While, then, the increased facilities that are being provided at our universities, or some of them, for the pursuit of the lines of research embraced under the still expressive terms anatomy and physiology of plants, may be expected to lead to advancement hitherto

unexampled, it is also to be feared that the direction thus given to the studies of college students will tend to lessen rather than increase their attention to field, or what is perhaps best known on this continent as systematic or species botany.

The energies of our college students and graduates will thus, in the future, be withdrawn, not wholly, it is hoped, but necessarily to some extent, from the mere work of collecting and naming specimens (in itself a valuable educational exercise), and from the practical study of botanical classification and the diagnostic characters of the genera and species of Canadian plants. We may still rely upon an increasing number of amateur workers throughout the country, persons of leisure, and even men laden with professional duties, who, while seeking a well-earned week's rest in a rural district, may tire of admiring beauties of field and wood, as if Nature offered a mere dumb show, and perchance turn even to botany books for some whisper of the language she speaks.

We have now a comparatively new, but rapidly increasing, source of botanical power in the large army of school teachers and their pupils in our academies and common schools throughout the country, botany being taught more or less fully in most of the provinces. They may well take up the work dropped by college students.

The collecting of facts, the finding of rare plants, the noting of the occurrence or absence of species in given districts, the recording of their times of leafing, flowering and fruiting, can best be done by residents in the several localities, and, if we could succeed in banding together the educational forces of the country for this purpose, even to a partial extent, immense service might be rendered to our science with the subsidiary advantage of increasing its popularity by giving a large number who at present do not aspire to be botanists some lot or part in its promotion. I am not unmindful of the excellent work that is being done, often in an unostentatious manner, by local societies, signally prominent among which, as a thorough working botanical society, we must place the Natural History Society of Ottawa. But the work now being done by such organizations may be largely aided and supplemented by a more general effort.

One great want of Canadian botanists is some easy channel of communication with each other. We have no society, and no publication, that will take cognizance of the local lists and scraps of observation that go to make up botanical periodicals so largely and that prove such fertile material in the hands of the botanical worker. There can be no doubt that the progress of botany in Britain during the present century has been largely due to the facilities of publication offered to even the humblest observers by such publications as Loudon's 'Magazine of Natural History,' the London 'Gardeners' Chronicle,' 'The Phytologist,' of Newman, the short-lived 'Botanical Gazette,' of Henfrey, 'Seeman's Journal,' the 'London Journal of Botany,' and other open records, of which everyone could avail himself for the purposes of giving or receiving information. But we have had no such publication in Canada. Thirty years ago an attempt was made to supply this want of our country by issue of the 'Annals of the Botanical Society of Canada.' That publication, during its brief existence, was chiefly remarkable for its local lists of plants, forbidding and unreadable to all but botanical students. Yet these lists gave it a certain permanent value that caused it to be eagerly sought for long after it was out of print. In the United States we have two ably conducted botanical periodicals, and others in England and continental Europe. All of these may be more or less available to Canadian botanists, but we are not able through any of them to be sure that we are really

bringing our facts within reach of our own fellow-countrymen, to whom they will be most useful. For the printing of the more finished class of papers, the publications of the numerous local scientific societies in Canada, now happily associated with the Royal, give opportunity, and the volumes of 'Transactions of the Royal Society' itself form the proper repository for such treatises as, by their elaboration or requirements of illustration, extend beyond the capabilities of the local societies. However, mere local lists, scraps, accounts of botanical excursions, unless they are marked by literary merit, or some feature extraneous to the mere record of botanical facts, cannot be expected to be acceptable to any of our existing publications, and thus the valuable facts which they embrace are apt to be lost to science.

It is with the view of suggesting the propriety of adopting some means for advantageously meeting the wants, whose existence I merely require to indicate rather than explain, that I have taken the liberty of now asking the attention of this section of the Royal Society. I do not propose that a botanical periodical shall be established. I hope, however, that some method may be devised whereby immediate publication of every season's botanical field observations throughout Canada may be secured. The completion of Prof. Macoun's great work, the "Catalogue of Canadian Plants," in which the working botanists of Canada have now a valuable guide, seems to be a fitting time for devising some suitable scheme.

My proposal, or suggestion rather, in brief, then is, not that the Royal Society shall take any action or new responsibility, nor that this section shall do so, but that its botanical members, and those who desire to associate themselves with them, shall form an organization of the simplest possible kind, for securing such of the results referred to as it may be thought wise to attempt,—to organize a band of gleaners, as it were, following as far as practicable the model of the old Berwickshire Naturalists' Field Club of Scotland, that did really good work under the admirably simple constitution that it should have no rules, no by-laws, no officers, no restraint of any kind, but the implied marching order that, on their field days, the members would voluntarily follow their leader as far as their own individual wills or inclinations might lead them. Our organization would possibly require some bond of union a little stronger than this. I forbear, however, to make any suggestion, even in that regard, further than to say that, if the botanical members of this section will agree to undertake the task and duties of local secretaries in their respective localities of some such prospective organization, a nucleus can be formed which may in time extend into an army of explorers pervading the whole extent of our Dominion. Each local secretary can, in his locality, direct the stream of local observations into the general channel, and thus secure valuable records or material that would otherwise be lost, and within his own range assist and encourage young workers in the many ways known to a botanist. Meetings of all the members of such a widespread organization could never be held at any one point, but it might be practicable, once a year, when we come up to the Royal Society's annual gatherings, for many of the local secretaries and other nuclear elements, to hold a conference, as is usual with similar clubs and offshoots of, for example, the British Association,—one of which, the old Ray Society, resembled in organization, although not in purpose, very much what is now proposed. But I am more anxious to hear the suggestions of my fellow members in this section on the points mooted than to put forth any more definite scheme.

III.—*The Gold-bearing Rocks of New Brunswick, and the possible discovery of remunerative gold deposits in that province.*

By L. W. BAILEY, M.A.

(Read May 28, 1891.)

The discovery of productive gold-fields is in most countries a matter of accident. It is naturally so, because, though metalliferous veins are not without definite conditions of occurrence and association, these are known to comparatively few, and all veins are subject to irregularities and uncertainties, which make the work of the prospector and miner difficult and often disappointing. Even when a country comes under the examination of a trained geologist, or the scrutiny of a geological survey, it may easily happen that the occurrence of precious metals may for a long time be overlooked. Especially will this be so when, as is usually the case, the auriferous district is rough, unsettled and forest-clad, the exposures being only such as are afforded by the channels of streams and rivers. Such has been the case in connection with the gold development of Nova Scotia and with those of other countries.

The possible occurrence of gold in New Brunswick was a matter of speculation long before its existence in paying quantities in Nova Scotia had been made known. Reports of "finds" in different parts of the province were numerous, and though many of them could not be traced to any reliable source, or were due to the mistaking of other minerals, such as pyrite or mica, for gold, yet some came from persons who were at once both competent and credible observers. Such were the reported discoveries of this metal made by Prof. C. H. Hitchcock in the vicinity of St. Stephen described in the reports on the Geology of Maine, and those of Prof. H. Y. Hind on the Tobique and Serpentine rivers, specimens in the latter case (from stream washings) having been shown in the Provincial Exhibition of 1870.

The discovery of gold in Nova Scotia naturally led to a much closer examination and to a better knowledge of the nature of the rocks containing it, and the circumstances of its occurrence. These were described minutely by numerous geologists, including especially Silliman, Hind, Hunt, Gilpin, Selwyn and others, and comparisons were instituted between the conditions there seen and those of other gold regions, including, in addition to North Carolina, California and Australia, the more recently discovered district in the Eastern Townships of the province of Quebec, notably on the tributaries of the Chaudière river. In the meantime the geological survey of New Brunswick was in progress, and as early as 1870, the author, in a joint report with G. F. Matthew, called attention to the close parallelism exhibited by some of the rock formations of New Brunswick to those of the auriferous series in the sister province. At that time the writer had not seen the gold-bearing rocks either of Nova Scotia or Quebec, but struck by the descrip-

tions given of the former he has ever since felt confident that rocks of the same general age and character exist in New Brunswick, and that gold in paying quantity would ultimately be found in them. During the summer of 1889 the author had an opportunity of hastily examining a portion of the Chaudière district, and more recently of making a more careful and extended examination of a part of the gold-bearing rocks in Nova Scotia, and he now proposes to state briefly the results of his observations as based upon a comparison of these three separate regions.

The portion of Nova Scotia personally visited by the author was that of Queen's and Shelburne counties, in the examination of which, on the part of the Canadian Geological Survey, he was engaged for a period of two months. In the first named county are situated the extensively worked and promising gold fields of Molega Lake and Whiteburne, and the features of the auriferous rocks here presented, with their associations, are known to be essentially the same as those found throughout the whole belt of gold-bearing rocks which form the southern sea-board of the province. As observed in the counties named the several divisions and the relations of these rocks are as follows, in ascending order:—

Div. I. Grey quartzite and slate, becoming, when altered, grey micaceous quartzites, mica-slate and gneiss.

Div. II. Grey and greenish grey, sometimes chloritic slates, becoming, when altered, mica-slate, chlorite slate, etc.

Div. III. Black, earthy pyritous slate, becoming, when altered, a black pyritous mica-schist.

Div. IV. Pale-grey, bluish-weathering argillites, sometimes pale-green or purplish, and ribbanded with paler bands.

Division I. In the interior these rocks are usually simple quartzites, occurring in massive beds, and greatly in excess of the slates, which often form mere partings between them, though sometimes of considerable thickness. The quartzites, commonly known as "whins," are very hard and of uniform texture, but usually a little micaceous, and holding scattered particles or crystals of arseno-pyrite and other sulphurets, together with native gold. This latter is found in white quartz veins, which usually occur between slate and quartzite, conforming to the strike and dip of the latter, though cross veins and veinlets also occur. The width of veins varies from a few inches to three or four feet, but in some instances is as much as thirty or forty feet. The most numerous and the most productive lodes are believed to occur towards the upper part of the whin formation, and especially along or in the vicinity of anticlinal folds, though it is not yet certainly known that they do not also occur in the synclinals. As a rule the large veins are not as productive as the smaller ones, and regions of highly inclined beds are more favourable than those in which there is less inclination. Numerous other details referring to the whins and their contained veins are given in the papers and reports of the authors already cited.

In approaching the coast, almost anywhere within the two counties referred to, the rocks become gradually more metamorphosed, and in many instances highly crystalline. It is, however, thought that all these metamorphic rocks are identical with the gold-bearing rocks of the interior, the alteration being connected with, if not caused by, the

association therewith of greater or less masses of evidently intrusive granite. Some of these are mere dykes, others protruding bosses, while a large belt of similar rock, starting from the coast about Barrington and Sable Island, sweeps around through the interior, enclosing the entire gold-field. The degree of alteration bears no very definite relation to the visible outcrops of granite, and the alteration is sometimes found many miles from the latter, though it is quite possible that in a vertical direction its distance may really be very small. It is noticeable also that the quartzites have been less affected than the associated slaty beds, some of the former being no more altered than those of the interior, even though they may be seen to alternate with glittering mica schists. The latter are sometimes garnetiferous, and very generally profusely studded with large and small crystals of staurolite, mica and other minerals. The metamorphic rocks are known to be gold-bearing, though to a less degree than the less altered rocks of the interior.

Division II. The grey and greenish-grey slates of this division are found near the summit of the whin series, with the upper beds of which they alternate. They are only distinguished from the slates of Div. 1 by their containing less heavy beds of quartzite or sandstone, and as being, with the latter, marked by the more or less abundant dissemination of chlorite. The gold mines of North and South Brookfield are situated in this portion of the series. In the metamorphic region, near the coast, they may be represented by chloritic schists and occasionally gneisses.

Division III. The black, earthy, pyritous slates of this division form a very characteristic and well-defined belt, resting upon the quartzites, and having, as seen in Queen's county, a surface breadth of between three and four miles. They are in places carbonaceous and sometimes graphitic. I am not aware that they yield gold, but both at Whiteburne and at South Brookfield they are but little removed from the beds in which that metal is profitably mined.

Division IV. The slates of this division are contrasted with the last in being generally of a much lighter colour, and, though often striped or ribbanded with bands of pale green or purple, are mostly grey and weather with a bluish tinge. Gold has been reported as occurring within the limits of this division, but, so far as I am aware, no profitable leads have yet been found.[1]

If we except certain obscure markings found by Dr. Selwyn in the slates of Lunenburgh, and which are supposed to be allied to the *Eophyton* of the Cambrian beds in Sweden, together with certain other forms equally obscure found by Prof. Hind at Waverley, some of which have been referred, under the name of *Rhabdichnites*, by Sir W. Dawson, to the trails of aquatic animals, and others, by Mr. Billings, to *Eospongia* and casts of *Orthis*, no fossils have yet been found in any part of the gold-bearing series of Nova Scotia by which its age can be fixed. While, however, the information thus afforded is very meagre, its tendency is strongly in favour of the view that the rocks in question are to be referred to the Cambrian system, a reference which is also probable upon other grounds.

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[1] More recent observations appear to indicate that the rocks of this division are not only newer than those of Divisions I-III, but unconformable with the latter, though no definite evidence as to age has as yet been obtained.

Quebec.

As in other auriferous districts, the gold of the Chaudière district in Quebec is found partly in the form of drift and partly as contained in quartz veins traversing the rocks of the country. Except so far as its distribution affords aid in determining its source, and the productive character of the rocks from which it was derived, the former has no interest in the present connection. In the Geology of Canada, 1863, the source of the gold was supposed to be the crystalline schists of the Notre Dame range, though the only actual find of the metal *in situ* was in connection with a quartz vein cutting slates then supposed to be of Silurian age. These supposed Silurian rocks were found to cover a large area, and were so mapped, but even at that time their general resemblance to the gold-bearing rocks of Nova Scotia was recognized and pointed out by the late Sir Wm. Logan. More recently this comparison has acquired increased significance from the fact that a closer study of the rocks in question, together with the discovery of characteristic fossils, leaves no doubt that the greater part of them, and probably all the gold-bearing portion, are not Silurian but Cambrian, and thus of the same age as those of Nova Scotia.

An important feature in connection with the Chaudière quartz veins is the very variable amount of gold which they contain, for while some were found to equal in richness those of the worked veins in Nova Scotia, others yielded a much less promising return, and some were apparently barren.

For further particulars relating to these rocks reference may be made to the reports of the Geological Survey, particularly to those of Mr. A. Michel and Dr. T. S. Hunt (1863-1866), and Dr. Selwyn, 1870-71, in which the results of numerous assays are given or referred to.

New Brunswick.

We come now to consider the grounds in favour of the probable occurrence of gold-fields in New Brunswick, and in doing so may first state what reliable information exists as to the actual finding of the precious metal in the province.

As before stated, reported discoveries have been very numerous, but many of these are unreliable. It is, however, worthy of notice that a considerable proportion of them have come from districts the known character and age of which, though unknown to the reporters, are such as would be favourable to its occurrence. In these districts also undoubted discoveries of the metal have been made. The finding of gold by the officers of the Maine State Survey near St. Stephen, in Charlotte county, has already been referred to. The rocks reported as containing it are black plumbaginous slates and quartzose mica schists, forming a portion of a series which in the Canadian Survey report of 1870-71 was described as resting upon, though probably distinct from, a group of granitoid gneisses, then regarded as possibly of Laurentian age. At a somewhat later period, the first named rocks were held to be either Cambrian or Cambro-Silurian, and were so represented in the published maps of the region. They will be again referred to in the sequel.

A second region in which there is good reason to believe that gold has to some extent been found is that of the Nashwaak river, above the village of Stanley, in York county. This region is the property of the large lumber operator, Mr. Alex. Gibson, and it is stated

that gold has been here obtained by his men, though nothing has been done to test the extent or richness of the veins. The localities reported are in connection with black slates and mica schists, also referred to the Cambro-Silurian system, though without the evidence of fossils.

A third region in which there is some reason to believe that gold has been found is that of the belt of hard slates and sandstones which in portions of York, Carleton and Victoria counties skirt the central granite axis of the province. These rocks are similar in character to those on the south side of the same axis, referred to in the last paragraph, and are believed to be of similar age. They include the areas about the head waters and some of the tributaries of the Tobique, where the drift gold exhibited by Prof. Hind was stated to have been found.

To these localities may be added that of Frye's Island, in Charlotte county, where beds of quartzite, associated with crystalline limestones, were found by Dr. A. A. Hayes of Boston to carry gold to the extent of $10 to the ton.

It will now be well to consider more particularly the character and relations of the rocks in the first two of the localities referred to.

As described in the Geological Survey report for 1870-71, the succession, as seen east and north of the town of St. Stephen, is as follows, the order being ascending:

I. Grey, rusty-weathering quartzose gneisses and pyritous mica-schists. These rocks are at various points associated with and invaded by masses of coarsely crystalline syenite and granite, evidently intrusive, and in the vicinity of the latter are themselves more crystalline, becoming garnetiferous and staurolitic, with occasional crystals of andalusite and tourmaline.

II. Grey, somewhat micaceous quartzites, also often pyritous and rusty-weathering, and associated with grey slates.

III. Black and rusty-weathering carbonaceous shales, with quartz veins.

IV. Grey and dark-grey argillites.

The resemblance of these rocks, both in character and succession, as well as in their relations to the granite, to the gold-bearing coast-belt of Nova Scotia will be at once apparent, a resemblance made more strking by actual familiarity with both.

Desirous of testing their supposed auriferous character, a visit was made by the writer in 1872, in company with Dr. T. S. Hunt, to a large vein of quartz occurring on the farm of Mr. Bolton of St. Stephen, a few miles north of that town, and one of the localities referred to by Prof. Hitchcock as containing the metal. Samples were taken at random and were assayed by Dr. Hunt, but failed to give any return. The vein examined was, however, a very large one, fully ten feet wide, and the experience of Nova Scotia is that the smaller veins are generally much more productive than those of larger dimensions. In this connection the experience of the Chaudière district may also be recalled, where, as already pointed out, the quartz veins were found to vary greatly in their yield of gold even in localities but little removed from each other. Further, these veins have not been studied with any reference to the attitude or relations of the associated strata, and the existence of anticlinals, found to be so generally important in connection with Nova

Scotia gold mining, has not been investigated here. While, then, the failure to obtain successful results in the case mentioned is discouraging, it is not conclusive, and is offset by the actual discoveries made by the officers of the Maine Survey both here and in Calais. Under these circumstances, and in view of the close resemblances which have been pointed out in the age, character and associations of the rocks of the district to those of Nova Scotia, we should certainly recommend further and more thorough explorations.

It may not be without value to notice in this connection a further feature in which the geology of this part of New Brunswick presents features similar to that of a portion of Nova Scotia known to contain gold. In the vicinity of Yarmouth, in the latter province, a series of highly chloritic, felspathic and hornblendic rocks is exposed, which have been described at some length by Dr. Selwyn in the 'Report of Progress of the Geological Survey' for 1870-71. With the chloritic schists black, earthy, pyritous slates occur, as well as masses of crystalline, epidotic diorite. An analysis of the green schists by Dr. Hunt showed them to contain traces of chromium, as they also occasionally contain crystalline grains of magnetic and titaniferous iron. On the authority of the author last named they are compared with the rocks of the Huronian system around lakes Huron and Superior, as well as with those of the so-called "altered Quebec Group," now also known to be of pre-Cambrian and probably Huronian age. Returning to New Brunswick, the rocks which immediately underlie the mica-shists, quartzite and black slates, described in a previous section, are found to be in part composed of actinolyte schists and in part of stratified chloritic and dioritic rocks, of which the latter, as assayed by Dr. Hunt, showed the presence of both chrome and nickel. Pyrrhotite and arsenopyrite are also met with, the former in such abundance as to have caused a mine to be opened on it. The resemblance of these rocks to those of Nova Scotia is very striking, and if, as has been supposed, they are also to be referred to the Huronian system, the overlying beds in each case being Cambrian, the parallelism is complete. It may be added that in the Yarmouth region, as in that of St. Stephen, in New Brunswick, specimens of quartz assayed by Dr. Hunt failed to show any traces of gold, though, since the assays, auriferous veins have been observed at several points.

A second locality which has been mentioned as probably gold-bearing is that of the valley of the Nashwaak river above Stanley. Here the general aspect of the rocks recalls portions of the auriferous coast-belt of Nova Scotia. Black, pyritous slates constitute a noticeable feature, and with these, apparently underlying them, are staurolite mica-schists and fine gneisses, which rest upon and are penetrated by intrusive granites. Grey slates and quartzites also occur, and in all the beds quartz veins are abundant, though little has been done to test their character. The rocks form a portion of a belt extending across a large part of the breadth of the province, and at various points exhibit like features.

The rocks on the northern side of the granite axis are still more like those of the Nova Scotia gold series. While the garnetiferous and staurolitic mica-schists are, as on the southern side, sometimes directly cut by the granitic mass, at others we find intervening between them and the granite, as at Yarmouth and as about St. Stephen, heavy beds of dioritic and hornblendic schists, while above are black slates, associated, as before, with grey slates and quartzites. Both north and south of the granite the slates hold quartz veins carrying sulphurets of antimony, lead, copper and molybdenum.

It will thus seem that, alike in their probable age, in their lithological aspects, in their stratigraphical arrangement and in their mineral accompaniments, the resemblance of the New Brunswick rocks in the districts described to those of the coast-belt of Nova Scotia would be such as to warrant the belief that both are alike gold-bearing, even had not the precious metal been proved to occur in the former as well as in the latter. It is therefore highly desirable that further efforts be made, of a systematic kind and by competent explorers, to ascertain to what extent the metal is present in the quartz-lodes of New Brunswick, and, if possible, to make them the basis of profitable mining. The fact that what are believed to be rocks of equivalent age are alike auriferous in Nova Scotia, in New Brunswick and in Quebec, as well as in more remote regions, gives great encouragement to the belief that the probabilities referred to will eventually be confirmed.

IV.—*Two Species of Trees from the Post-Glacial of Illinois.*

By D. P. PENHALLOW, B.Sc.

(Read May 27, 1891.)

Last year Prof. O. Marcy, of Evanston, Illinois, transmitted to me two specimens of fossil wood for determination. One was obviously an oak and the other a coniferous wood of some kind, which Prof. Marcy thought possibly might be a *Thuya*. Both were in such a state of preservation as to admit of treatment with caustic potash, and the subsequent preparation of sections with an ordinary microtome. The sections showed the structure to be on the whole well preserved, though in the oak, somewhat modified by decay and pressure.

GEOLOGICAL POSITION.

From the data furnished by Prof. Marcy, I am able to make the following statement respecting the geological position of these plants :—

As appears from the accompanying map,[1] three lake ridges are prominently developed in the immediate neighborhood of Chicago. Two of these, the middle and lower

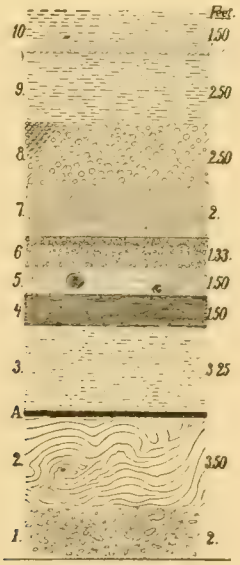

FIG. 1.

beaches, have their western terminations on the shores of the present lake at Evanston, where the water has so encroached upon them as to make a cutting, exposing the ridges in section. The relations of the various deposits thus brought to view are exhibited in the sectional figure (fig. 1).

[1] Plate III.

From this it appears that the boulder clay is found at about the present level of the lake. Immediately above the boulder clay is a thin layer of soil (A), in which the coniferous wood was found. Following this are 3.25 feet of gravel and 1.5 feet of peat, containing shells. The peat is covered by 1.5 feet of fine sand, in which the oak was imbedded. The peat (No. 4) includes at the top, shell marl. The shells embrace such forms as those of *Planorbis*, *Limnea*, etc,, in all, nine different genera, which Stimpson pronounces to be of existing species. The local evidence is such as to confirm the view that the *Picea* grew upon the spot where found, sending its roots down into the clay.

The cross section (fig. 2) supplied to Prof. Marcy by Dr. E. Andrews, shows the position (S) of the layer of peat, corresponding to No. 4 of figure 1.

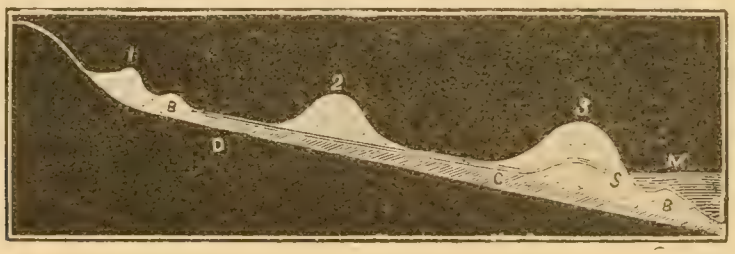

Fig. 2.

Figure 1 is a section of the lower beach at the point where it is cut by the lake, and about six years ago, bones of the mastodon were found *in* or *on* the layer of peat (No. 4) thus exposed.

Prof. Marcy expresses the view, based upon Spencer on the Iroquois Lake,[1] that at the time the *Picea* grew, the waters of the lake were as low as, or lower than now. The waters afterwards rose and formed the upper beach, then the middle, and finally, the lower beach, which is still in process of formation. At the high level, there was a bay covering Chicago, and an outlet through Lemont. From these data it would appear that the formation is a recent one, and Sir Wm. Dawson seems inclined to consider it as early post-glacial.

Descriptions of the Woods.

Quercus.—The oak is sufficiently well preserved to render good transverse and longitudinal sections possible, after treatment with caustic potash. In the transverse section only the general structural features can be made out, with the exception of the thyloses, which are very clearly defined. The wood cells have been so far brought under the operations of decay, as to render it impossible to make out their detailed characters. The same cause, of course, has equally affected the structure as exposed in longitudinal sections; so much so that it was not possible to obtain satisfactory drawings of the various structural features. Here and there these were made out with sufficient distinctness to serve as the basis of the description given.

By comparison with recent species of *Quercus*, this fossil appears to most nearly approach *Q. prinus* and *Q. garryana*, the affinities being nearer the former than the latter. Such differences as could be definitely established, were found in the length of the ray

[1] 'Amer. Jnl. Sc.' xl, 447.

cells, the abundance and form of the markings on the vessels, and the number and size of the medullary rays. These differences are such as to render exact identification with modern species hardly probable, and as a suitable means of distinction and recognition I would therefore propose for this fossil the name of *Quercus marcyana.*

Picea.—The wood of the *Picea* was cut with as great facility as the oak, and while the transverse sections were quite clear as to the details of structure, the longitudinal sections also gave numerous well preserved details, from which a series of drawings (plate II) were prepared.

So far as the details have been made out, they seem to establish affinity with *Picea sitchensis*, but as in the case of the *Quercus*, the differences are such as to cause hesitation in establishing exact identity between them. Were it possible to establish identity between the two, then there would be good evidence to show the extent to which the area of distribution of *Picea sitchensis* has contracted within recent geological time, since this species is now essentially confined to the Pacific coast, from Alaska to Mendocino, California, extending inland not more than fifty miles. I deem it expedient to distinguish this fossil by a separate name, for which I would suggest *Picea evanstoni.*

Quercus marcyana, n. sp.

Transverse section. Growth rings defined only by apposition of wood and vessels. No obvious distinction of spring and autumn wood. Wood cells irregularly disposed, the largest about 0.04 mm. in diameter.

Vessels numerous and large, measuring about 0.20 × 0.30 mm. compressed tangentially, chiefly in zones, alternating with zones of wood of about the same width. Thyloses conspicuous. The larger medullary rays are about 0.24 mm. broad, and usually separated by about twenty narrow rays of one cell in width.

Radial section. Markings of the vessels obscure, owing to the operation of decay.

Thyloses conspicuous and abundant, and showing few round pits.

Medullary rays well developed; cells short, usually once or twice as long as broad; walls rather thick and irregular, with numerous small channels; ends square or somewhat oblique. Perforations on the radial walls round, conspicuous and somewhat numerous.

Tangential section. Thyloses conspicuous, the markings numerous and composed of narrow slits. Markings on the walls of the vessels somewhat conspicuous and composed of linear or narrowly elliptical slits.

The smaller rays usually one row of cells wide, few to many cells high. The larger rays are many cells broad and very high.

Picea evanstoni, n. sp.

Plates II and III.

Annual rings well defined; tracheids of the autumn wood rather thick walled, of the spring wood thin walled, with a single row of unequally disposed bordered pits.

Medullary rays from two to twenty cells high, usually of one row, or occasionally of three rows of cells at the centre. Resin tubes conspicuous in the autumn wood, but not numerous.

Transverse section Annual ring well defined, the autumn wood about equal to the spring wood. Cells disposed in radial rows, usually about five rows between the medullary rays. Rays somewhat abundant and narrow. The resin passages are not large—55.7 – 103 8 μ in diameter,—conspicuous and located wholly in the autumn wood, chiefly forming a row on its inner face. Many annual rings wholly destitute of resin passages.

Radial section. The thick walled tracheids of the autumn wood provided with a single row of bordered pits, somewhat irregularly disposed, the outer ring 6.9 – 13.8 μ in diameter. The thin walled tracheids of the spring wood with bordered pits in a single row and often scattering, the outer ring 6.9 – 17.3 μ in diameter. The medullary rays somewhat abundant, the cells rather long and thin walled, and showing pits.

Tangential section. The medullary rays usually composed of a single series of cells, sometimes showing two or three rows at the centre; usually from two to twenty cells high. No pits in the tangential walls.

EXPLANATION OF PLATES.

PLATE II.

Picea evanstoni.

1.—Transverse section showing demarcation of growth ring, and a medullary ray. × 290.
2.—Tracheids showing bordered pits (*a*) of the spring wood, and (*b*) of the autumn wood. × 300.
3.—Medullary ray passing through the spring wood, showing structure and pits on radial walls. × 290.
4.—Medullary ray passing through the autumn wood, showing pits on radial walls. × 300.
5.—Tangential section of medullary rays of the ordinary form. × 290.
6.—Tangential section of one of the broad medullary rays. × 266.

PLATE III.

Map showing lake ridges in vicinity of Chicago.

V.—*Illustrations of the Fauna of the St. John Group, No. VI.*

By G. F. MATTHEW, M.A.

(Read May 27, 1891.)

(A) FAUNA OF THE BRETONIAN DIVISION (DIV. 3) OF THE ST. JOHN GROUP.

The writer has had opportunity to complete for this article a study of only a part of the faunas of this Division, viz.: those that belong to the Cambrian age. The later Ordovician fauna will form the subject of a future communication.

In describing these species he has taken the fossils collectively according to their zoological standing, and not according to the several zones in which they occur, but he has designated the special zone under each species.

For reasons that will be seen in the sequel, he has substituted Zone of *Parabolina spinulosa* for "Zone of *Leptoplastus stenotoides*" of his preceding paper.

DICTYONEMA, *Hall* (1851).

The earliest reference to fossils of the graptolite type, and perhaps to that species which is specially the subject of this description, is that of Magnus von Bromell.[1]

In his work, "Lithographiæ Sueconæ, specimen primum et secundum (1727)," among other matters, he gives an account of a collection of fossils belonging to himself, "De vegetalibus fossilibus et lapidefactis." In specimen secundum the first article bears the title "De musco incrustato et in lapide depicto." He describes No. 1 as "Lapis cinerei coloris fissilis fœtidus Suillus dictus in superficie ostendens musci ramosi capillamenta nigra, subtilissimo quasi penicillo expressa, inventus in arenariis parœciæ Giærstad, prope oppidem Schenningiam in Ostrogothiæ."[2]

The rock described by Bromell as "lapis Suillus" appears to have been anthraconite or fetid limestone. "If," says Tullberg, "Bromell's description of the mineral is correct, it can almost with certainty be concluded that he, by his description, meant to indicate a Dictyonema. Nothing in his description forbids such a supposition. He denominates it 'musci ramosi capillamenta nigra,' and compares it further to a dendrite. At the same time, however, he points out its dissimilarity from such forms, in that it does not penetrate the stone, but is found showing a delicate figure on the outer surface (layer) of the stone only."

[1] The following notes are chiefly from S. A. Tullberg's article "On the Graptolites described by Hisinger," etc. See "Bihang till Kong. Svensk. Vet. Akad.," Handl. B. 6, No. 13.

[2] A fissile, fetid, ash-coloured stone, called swinestone, showing on its surface black threads of a branching moss, as if drawn with the most delicate pencil. Found in gravelly places (or pits) of the parish of Gierstad, near the town of Schenning, in East Gothia.

Tullberg says *Dictyonema flabelliforme* is very common in the youngest alumenaceous shales of Ostrogothia, and in other provinces also balls of anthraconite[1] are frequently found in similar strata, which contain the same fossils, as shown when they are split open.

Heisinger describes and delineates in his "Lethæa Suecica, supplementum secundum" (1840) three species of graptolites, of which Dictyonema is regarded as a monocotyledonous plant.

DICTYONEMA FLABELLIFORME. Eichw. (Pl. XII, figs. 1, 2 and 3 *a* and *b*.)

1727—*Musci ramosi capillamenta nigra*, Bromell.
1840—*Gorgonia flabelliforme*, Eichwald. Schichten syst. Russlands.
1854—*Phyllograpta*, Angelin. "Palæont. Scand.," I, p. iv.
Prior to 1857—*Fenestella socialis*, Salter. 'Mem, Geol. Surv. G. B. III,' p. 536.
1857—*Graptopora socialis*, Salter. 'Proc. Am. Ass. Sci.'
1862—*Rabdinopora flabelliforme*, Eichwald. "Lethæa rossica."
1862—*Dictyonema Heisingeri*, Goeppert. "Uber die fossil flora, etc.," I, i, p. 369.

The following description of this species is given by Tullberg:

"The hydrosoma forms by its branches a flat extended disc,[2] growing out from a long narrow sicula, which in its distal part divides into two branches, which immediately again give off new branches; by reiterated dichotomy a multitude of sub-parallel branches appear, connected by fine chitenous filaments, which in short, almost regular distances are stretched out nearly horizontally from one branch to another. Every branch bears, as it appears, two series of hydrothecæ, alternating with each other. The horizontal chitenous threads seem always to arise from the apertural edge of a hydrotheca; in certain forms there is seen one thread extending from every hydrotheca—this is not the case in Hisinger's specimens; on others, on only one of two thecæ, which seems to be most common for examples from Fagelsang and for that from Piperviken, in Norway; on other specimens again, only every third or fourth theca bears one chitenous thread extending to the nearest branch; this has been observed on several specimens from Aby, in Ostrogothia, which are preserved in the State Museum at Stockholm. The hydrothecæ are to be observed only on well-preserved specimens, and on these with difficulty; they seem to form elongated tubes, with the apertural edge scarcely projecting forward; sometimes there are to be seen long impressed lines indicating interior septa. On a length of 10 mm. there are 10 to 15 hydrothecæ. There are no traces of a vergula.

"To separate from each other, as different species or even as varieties, those forms which have a different number of horizontal filaments, seems to be erroneous, their number even in the same specimen being variable.

"This species attained a considerable size, individuals of 15 to 20 ctm. in length having often been found. Yet at some horizons the specimens are commonly small. The individuals have lived sociably together, of which the shales of the youngest Scandinavian Cambrian rocks, covered with their polyparies, afford evident proof.

"This species occurs always at a fixed horizon, namely, in one of the youngest beds[3] of the Cambrian system, which is called the Dictyonema shale."

Herr Tullberg adds the following note:

[1] "Anthraconite or swinestone is crushed and powdered by the peasantry of Sweden as a medicine for sickly domestic animals. Doses of this powder are given especially to swine, from which circumstance also its name is derived. Solutions of swinestone are in some parts of Scania in great demand as articles of trade."

[2] See Tullberg's note further on in regard to the form.

[3] This is the view of the Scandinavian palæontologists, who exclude the Tremadoc group=Ceratopyge beds, from the Cambrian system.

"*Correction.*—When this paper had already been printed Prof. Brögger told me that he did not share my views on the structure of *Dictyonema flabelliforme*, and he considered that it really has its branches arranged in a funnel or inverted cone, and that it is endowed with hydrothecæ resembling those of other graptolites. * * * Having heard Prof. Brögger's opinion, I found in the museum of the Swedish Geological Survey some well-preserved specimens in demi-relief, and I examined them as accurately as possible. In splitting the plate I found that a lower lamina of the branching hydrosome really originated from the same sicula as the upper lamina. On the lateral branches real hydrothecæ were apparent, resembling those of the Dichograptidæ. That they are so rarely observed depends probably on the circumstance that they are directed inward toward the centre, and that they are covered by the polypary when compressed in the slate. On the lateral branches they are sometimes visible, because they are sometimes directed outward."

This view of the form of the hydrosome of Dictyonema was stated by the late Mr. Salter in volume iii 'Memoirs of the Geological Survey of Great Britain,' and is also set forth by Prof. Hall in his original description of the genus.

Tullberg's former view that the hydrosome was fan-shaped is that which at first suggests itself, when we observe how invariably the polyparies are flattened out in the shale in which they have been preserved. Dictyonema, as it floated in the ocean, was no doubt fully expanded to a funnel or vasiform shape; but while the delicate threads which maintained the hydrosome in this shape were sufficient to keep the branches apart in life, when in time it sank to the muddy bottom of the sea it collapsed, and the flattened sides, being kept slightly apart only by the multitude of little spines of the hydrothecæ, would nearly come together. Supported thus, a small space was left between the opposite sides of the hydrosome, which gradually filled with fine mud; when the shale is split away from the hydrosome the spines of the hydrothecæ of the lower side of the hydrosome are sometimes seen as minute shining dots in rows between the branches of the upper side of the hydrosome. Owing to the irregularity of the inner surface of the hydrosome, the fossil invariably splits along the smooth outer surface, and thus the cells are usually invisible.

Dictyonema flabelliforme is known from other countries than Scandinavia, Russia and Britain. It has long been known to occur near Spa, in Belgium, where it was at first thought to be of vegetable origin,[1] and so considered until 1847. Prof. C. Malaise[2] has written an article on this fossil, which appears to be common at several localities in the east of Belgium, and which there, as in most countries, is a solitary fossil in the sense that few or no other species occur with it. Excepting two fucoids, the only fossil announced is a lingula; and in Wales, according to Prof. Ramsay, only some small lingulas occur with Dictyonema. The fauna described in the following pages is therefore exceptionally rich for this horizon.

Prof. G. Dewalque asserts that the geological position of this species is in the lower part of the "système salmien" of And. Dumont, above the "système revinien," and that it gives as definite a horizon in Belgium as it does in Wales and Scandinavia. Prof. Malaise considers that of the few Cambrian fossils found in Belgium *Dictyonema sociale* (=*flabelliforme*) characterizes the Upper and *Oldhamia radiata* the Lower Cambrian rocks of that country.

In two other districts of Eastern Canada beside that of St. John, *Dictyonema flabelliforme*

[1] Omalius d'Halloy, "Description geologique des Pays-Bas," 1828.

[2] "Documents palæontologiques relatif au Terrain Cambrien de l'Ardenne." Brussels, 1881.

has been found. On the lower St. Lawrence at various stations from Matane to Cape Rosier the species has been met with. Examples from these places, belonging to the collections of the Geological Survey of Canada, have been examined and determined by Prof. Charles Lapworth.

Another district where the species has been found is at Barrasois River, in Cape Breton. At the latter place it is said to occur (as at St. John) in company with "Oleni."[1]

Among the examples of this species found in the black shales of the Bretonian Division at St. John three varieties may be observed.

Var. *confertum*. Linrs. Mss. ?

Dr. Brögger in his work on the Cambrian and Ordovician rocks of Norway mentions several varieties of this species,[2] and among them that above named. This, he says, has a net-like web, *which is very fine and close, for which reason the threads connecting the branches are always very fine.*

This description agrees well with the characters of a form which is particularly prevalent in the lower beds at St. John containing Dictyonema (Div. 3 *b*). It is distinguished from the more common form of the typical Dictyonema beds (Div. 3 *c*) by more frequently assuming the vasiform shape, as distinguished from the broad funnel-formed hydrosomas, which are the more common in the typical beds. Not only are the connecting threads very fine, but they are more numerous than those of the common form. In this variety the branches of the hydrosoma are nearly a millimetre apart, and there are from five to seven connecting threads between the branches in a space of a centimetre. From twelve to fourteen hydrothecæ are found in the space of a centimetre.

As regards the number of connecting threads between the branches, this form agrees with that mentioned by Tullberg as occurring at Fagelsang, in Sweden. (See p. 34.)

Var. *Acadicum*, n. var.

This variety in its general outline agrees with the typical form of Sweden, and no doubt represents it here. Although sometimes vasiform, it is more frequently funnel-shaped, and the mesh of the hydrosoma is more open than with the last. The branches are straighter and divide more frequently, and the connecting threads are stronger.

In this variety the branches vary in number from two in the space of about 3 millimetres to three in a space of 4 millimetres. There are usually from four to five threads between the branches in the space of 1 centimetre, and *from sixteen to seventeen hydrothecæ are found in the same space along the branches.*

This variety is rare in the lower layers, where var. *confertum* occurs, but very common in some beds at the typical horizon (Div. 3 *c*). It represents the typical European form, but differs in having more numerous hydrothecæ on its branches. Tullberg mentions that the Scandinavian variety (the type of the species) has from 10 to 15 hydrothecæ in a space of 10 millimetres.[3]

[1] By "Oleni" the later allied forms, Parabolina, etc., may be intended. I confidently anticipate the discovery of the Peltura fauna beneath the beds with *Dictyonema flabelliforme* on the Lower St. Lawrence.

[2] "Die Silurischen Etagen," 2 und 3, p. 35.

[3] Graptolites described by Hisinger, p. 20.

Var. *Norvegicum.* Kjerulf ?

Dictyonema Norvegicum, Kjerulf Veiviser, etc. Pl. ii, fig. 1.

There is occasionally found in the middle and upper layers of the Dictyonema shale a form which appears to correspond to this variety.

Dr. Brögger describes the variety as having *thick cross-threads connecting the branches, and also that the net-like web is close, producing small, short, corner-like meshes.*[1] He further says that while the cross-threads are thick, they are not nearly as thick as the branches of the hydrosome.

In our form which is referred doubtfully to this variety, the threads sometimes appear nearly as thick as the branches, but usually they are considerably thinner; the web is larger and more open than that of the Norwegian form. It probably runs into the typical variety.

To present in a synoptical form the chief features of these Acadian varieties of *Dictyonema flabelliforme* the writer has noted the principal distinctions in the following table. In this the examples are arranged according to the form of the hydrosoma, and the length and width are given in millimetres. The number of branches at the end of the hydrosome and the number of cross-threads and of hydrothecæ in the space of ten millimetres.

Number.	Name of variety and form of hydrosoma.	Hydrosoma.					Hydrothecæ in 10 mm.
		Length, mm.	Width, mm.	Proportion of length to width.	Number of branches.	Cross-threads in 10 mm.	
1	Var. confertum? young	50	15	3.33—1	16	5.	
2	" " vasiform.....	175	35	3. —1	35	5.5	
3	" " "	75	35	2.14—1	32	5.	
4	" " "	90	45	2. —1	40	5.	
5	" Acadicum, "	85+	50	1.70—1	46	4.5	17!
6	" " young, "	33	20	1.65—1	16	4.5	17
7	" confertum? "	110	70	1.57—1	65	7.	
8	" " "	125	80	1.56—1	75	7.	
9	" Acadicum, funnel form.....	110	80	1.37—1	65	5.	
10	" Norvegicum? "	110	80	1.37—1	68	4.	
11	" confertum? "	60	45	1.33—1	45	6.	12
12	" Acadicum, "	75	65	1.15—1	50	5.	
13	" confertum? "	40	35	1.14—1	35	6.	14
14	" Acadicum, young, funnel form..	35	35	1. —1	40	6.	16
15	" " " " ..	80	90	.90—1	60	5.5	16
16	" " " " ..	30+ (150?)	135	.....	95	4.5	

[1] "Die Silurischen Etagen," 2 und 3, p. 36.

Growth and Development.

The growth and development of Dictyonema is full of interest to the biologist. When it budded from the sicula it developed two upright-growing branches, which in their turn branched again without showing the characteristic cross-bars which united the later branches of the hydrosome. It is on these tertiary branches that we first see the connecting threads that held together the circle of branches; hence Dictyonema began its growth as a Dichograptid, with the hydrothecæ turned inward toward each other on the branches. But the branching was not always so regular as the above remarks might imply, for sometimes while about half the branches branched simultaneously, the other half would continue to grow without branching for some time longer; these colonies then would take the form of Bryograptus, before assuming the generic characters of Dictyonema.

From the tertiary branches upward the branches of the hydrosome are connected by transverse filaments, which at first are far apart, but soon become numerous enough to form the typical net of a Dictyonema. At first the branches are far from parallel, and, being few, have sometimes been flattened on their sides in the shale, thus exposing the hydrothecæ to view. In the upper part of the rods the serratures are rarely seen, owing to the fact that they are there turned inward from the outer face of the hydrosome. Near the sides of the hydrosome, where the branches are more liable to be pressed on their sides, the hydrothecæ sometimes show themselves on the outer, sometimes on the inner side of the branch. The inward orientation of the cells is very manifest in the primary and secondary branches, showing the close relation of this genus with Dichograptus and Bryograptus.

Bryograptus is known to occur just above the horizon which carries *Dictyonema flabelliforme*. Two species have been described from the Swedish beds and others from Great Britain. A more slender form of Dichograptid, which by H. A. Nicholson has been referred to Trichograptus, and by O. Hermann to Clonograptus, was described by J. G. O. Linnarsson, some years ago, from beds containing *Sphærophthalmus alatus*. This therefore should have been somewhat older than the true Dictyonema beds. Of one of the species which is found just above the Dictyonema beds, *B. Kjerulfi*, Dr Brögger says that it appeared to be branched like a bush, and so would resemble the initial branches of Dictyonema.

One writer suggests that the lower irregular part of the hydrosome in Dictyonema was a sort of root or support in the form of a cage buried in the mud by which the colony was anchored, but such a view does not seem tenable, as the whole of these lower branches from the sicula upward, are edged with cells or hydrothecæ, and the sicula itself is too small to have given any support. From the way in which the hydrosomes are scattered over the layers of the shale, it would rather seem that the colonies were free to float through the water and sink to the bottom when their term of existence was over.[1] While some layers are covered with entire hydrosomes, others are besprinkled with the fragments of broken colonies, mingled with minute budding siculæ or young polyparies in the first stages of growth. In these young examples the branches are often obscured or concealed by a (chitenous ?) growth, perhaps analogous to the disc in some of the Dichograptidæ.

[1] Salter's figure ('Mem. Geol. Surv. G. B.,' vol. iii, pl. iv, fig. 1) is not a natural representation of the way in which this species is scattered over the layers of shale.

BRYOGRAPTUS, *Lapworth.*

Bryograptus Kjerulfi. Lap.?[1]

A graptolite which may belong to this species occurs with the earliest form of Dictyonema present in the St. John basin.

Unfortunately the material obtained for this species is very fragmentary. It is, however, of such a nature that it cannot belong to a Dictyonema, as it consists of branches that are wider than those of *D. flabelliforme*, and are free from each other.

The branches of the hydrosome are about 1 mm. wide, and there are from twelve to thirteen hydrothecæ in a space of 10 millimetres.

Horizon and Locality.—In the black slates of Division 3 *b*, at Navy Island, St. John Harbour.

Lingulella lævis, n. sp. (Pl. XII, fig. 4 *a* and *b*.)

A large oval-ovate species, with a very thin test, resembling a Lingula in its thin hinge line, but having a pedicel groove.

Sculpture.—The shell has a smooth, shining surface, but when observed with a lens very fine concentric and fainter radiating lines are made visible.

Size.—Ventral valve, length, 15 mm.; width, 11 mm. Dorsal valve length, 14 mm.; width, 11 mm. Another dorsal is 17 mm. long and 15 mm. wide.

Horizon and Locality.—In dark grey slaty shales of Div. 3 *a* on the right shore below the "Falls," St. John Harbour.

Among Hall's species of the Potsdam sandstone of Wisconsin *Lingula aurora* comes nearest this, but is smaller. No British species of the Upper Cambrian appears to be nearly related to it.

OBOLELLA, *Billings* (1861).

The following is Billings' definition of this genus:—"Shell ovate, circular or subquadrate, convex or plano-convex. Ventral valve with a false area, which is sometimes minute, and usually grooved for the passage of the peduncle. Dorsal valve either with or without an area. Muscular impressions in the ventral valve four; one pair in front of the beak, near the middle or in the upper part of the shell, and the others situated one on each side near the cardinal edge. Shell calcareous. Surface concentrically striated, sometimes with thin, extended lamellose ridges.

"In general form these shells somewhat resemble Obolus, but the arrangement of the muscular impressions is different. In Obolus the two central scars have their smaller extremities directed downwards, and converge towards each other; but in this genus the arrangement is exactly the reverse."

The three species which Billings referred to this genus were *O. chromatica* from the Potsdam Sandstone at the Straits of Belle Isle, *O. crassa* (=*Avicula* ? *desquamata* Hall) of the primordial limestone at Troy, N.Y., and *O. polita* of the Potsdam Sandstone of St. Croix R., Minnesota.

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[1] Better material, collected since the article was written, enables me to say that this is not *B. Kjerulfi.*

Prof. Jas. Hall had about this time, 1861, described the features of the interior of *Obolella polita*, from which for the first time palæontologists were enabled to gain a fair knowledge of the peculiar internal markings of the shells of this genus, and it is evidently congeneric with the species described by Billings.

Messrs. Meek and Hayden also at this time described a species of Obolella from the Black Hills of Dakota,[1] which Mr. Walcott has since declared to be identical with *O. polita*. To the three species first included in the genus Mr. Billings subsequently (1860) added the following:[2] *O. pretiosa* from the Sillery sandstone, *O. desiderata* from the Levis graptolite beds and *O. Ida* from the Levis limestone (Nos. 1 and 3)—the last three near Quebec.[3]

Subsequently (1876) Billings described more fully, from specimens exhibiting the internal characters of *O. chromatica*, the generic features of that particular species.[4]

In 1872 Mr. Billings described two other species of Obolella from the conglomerate limestones of the St. Lawrence Valley, which Mr. Walcott and others refer to a Cambrian terrain, viz., *O. gemma* and *O. circe*.[5] Of these the first is more linguloid in form than any other species of the genus. The second, *O. circe*, is described as presenting many points of resemblance to *O. crassa*, but is distinct by the internal features of the ventral valve.

Meanwhile (in 1863) Mr. S. W. Ford had described another small species of Obolella from the Primordial limestone of Troy, N.Y., viz., *O. nitida*.[6] Of this he obtained only the dorsal valve, and the internal markings were not well enough shown in any of the specimens to admit of description.

Subsequently in 1881,[7] Mr. Ford wrote an excellent article on the genus in which he compared at some length the specific characters of the species *O. crassa*, *O. chromatica* and *O. gemma*. He also expressed the opinion that *O. desiderata*, Bill, and *O. sagittalis*, Salt, did not belong to the genus, and would be found to constitute a new genus, which, however, he did not name

In 1885 Mr. C. D. Walcott defined this genus—Linnarssonia—and gave for comparison figures of *O. chromatica* and of the species referred to the new genus. He also divided the species left in Obolella into three groups, taking *O. gemma* and *O. crassa* as types of the original genus.[8] In the third group he included *O.* (?) *polita* Hall, and his own species *O. ambigua*, but not defining this any further.

The next important work on this genus was also done by Mr. Walcott, who figured and described new examples of several of the species, and brought together the figures and descriptions of others.[9]

In these several articles and works are the data used for comparison of the characters of the following species:—

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[1] Pal. Upp. Missouri, p. 4, figs. 3 *a-d*.

[2] Pal. Foss., p. 67.

[3] Of these species *O. pretiosa* is found to be a *Linnarssonia* (a genus separated from Obolella by Mr. Walcott) *O. desiderata* is from Ordovician strata and of *O. Ida* the internal markings are unknown; none of these can be counted as true Cambrian Obolellæ.

[4] 'Am. Jour. Sci.,' Vol. II., p. 176.

[5] 'Can. Nat. & Geol.,' 1871.

[6] 'Am. Jour. Sci.,' 3 Ser., Vol. V., p. 213.

[7] 'Am. Jour. Sci.,' Vol. XXI, p. 131.

[8] Billings, however, described *O. chromatica* as the type of this genus.

[9] 'U. S. Geol. Surv.,' Bull, 10 (1886).

OBOLELLA (?) GEMMULA, n. sp. (Pl. XII, figs. 8 *a–c*.)[1]

Ovate acuminate, sides somewhat straight in the posterior half, somewhat broadly rounded in the anterior half of the shell. Test corneo-calcareous.

Dorsal valve blunt, depressed at the umbo. Interior smooth except at the posterior end, where, concealed in the blunt beak, is a short ridge, dividing the small scars of the adductor muscles; a small scar on each side of the valve close to the edge, and about one-third from the beak marks the attachment of the adjustor muscle. Opposite this there is a slight elevation or ridge on the median line of the valve.

Ventral valve acuminate behind; it has a small triangular area, with pedicel groove and low beak. The interior of the valve has a ridge, most distinct in the posterior third, along the median line; the part of the ridge appears double in some shells, but in others only a single sharp ridge. On each side of this part of the ridge, but not extending its full length, are the suboval scars of the adductor muscles. The central part of the shell is occupied by a large bi-lobed sub-circular scar. The outer borders of these two scars or depressions of the shell are defined by a sharp line, elevated in the middle of its length, and there bent toward the centre of the shell. The margin of the valve appears flattened and crenulated.

Sculpture.—This consists of concentric ridges and lines, and of less conspicuous radiating ridges.

Size.—Length of ventral valve, 4½ mm.; width, 3½. The dorsal valve is one-half of a millimetre shorter.

Horizon and Locality.—In a bed of fine grey shale in the Dictyonema beds Div. 3 *c* at Navy Island, St. John Harbour.

Although in some respects resembling a Lingulella, there are in others such wide differences in this little shell that we have sought for relations to other genera, and notably to Obolella. So far as can be gathered from the descriptions of authors the shell substance in this genus is calcareous, though in regard to *O. polita* Mr. Hall speaks of this as doubtful. In most of the species of this genus also the dorsal valve is shown to possess an area at the hinge line. In this respect the new species differs, as the area, if any exists, is very short. However, this does not appear to be of so much moment as the best known species of Obolella had littoral habits, requiring a stronger shell than would be needed for a species living in deep, still water. A similar difference is observable between the species of Obolus described in this article and *O. Apollinis* of Russia.

In the general form of the visceral cavity, as well as in the details of its anatomy, there are many points of resemblance to Obolella. The mesian ridge of the ventral valve is one of these, extending as it does in its full strength somewhat beyond the bifid muscular scars under the cardinal area; and the incurved points of the bounding ridges of the visceral cavity is another. The peculiar depression along the posterior half of the median ridge appears to correspond to the pit within the area of the ventral valve, seen in several species of Obolella.[2] A structure similar to this is seen in *O. ambigua*, and in *O. polita* this

[1] The lithographic plate is too coarse to show well the characters of these and the following species of brachiopods.

[2] *O. gemma*, *O. crassa* and *O. chromatica*.

part of the shell is said to have a flatly rounded ridge. In all these cases the flattened or groove-bearing ridge projects forward into the central cavity of the shell.

The dorsal valve in our shell departs more widely from the type of Obolella in its comparative smoothness within, as well as in the absence of an area. Beside the linear scars along the lateral edges the only marked feature is the sharp little ridge within the umbo. No such ridge is figured for any of the Obolella unless it is *O. gemma*.[1]

I do not know of any shell similar to ours having been described from the Dictyonema beds of Sweden, Norway or Britain.

LINNARSSONIA, *Walcott* (1885).

In connection with the sketch of the history of Obolella, given on a previous page, the writer has referred to the separation of the above genus from it.

Mr. Walcott included in it *O. sagittalis* and *O. transversa*. And there should be added a species occurring in the Protospongia beds of Metis, P.Q., as well as *O. pretiosa* of the Sillery sandstones, which Mr. Ami states is a Linnarssonia. *O. miser* of the Paradoxides beds of Newfoundland seemingly belongs here, and here also it seems necessary to place a small brachiopod found with the preceeding species. It is closely allied to one which the author has referred to *O.* (*L.*) *misera*, found in the Paradoxides beds at St. Martins, N.B.

Linnarssonia belti. Dav.? (Pl. XII, figs. 7 *a–c*.)

Shell oblately orbicular. Test corneous.

The dorsal valve (?) resembles that of the shell (*O. misera ?*) in the zone 1 *d* of the St. John group, being like that of an Acrotreta in its internal markings.

In the ventral valve we do not see the strong scars and V-shaped ridge at the umbo of the typical forms of Linnarssonia, but in their place small scars, and two faint V-shaped lines extending from the umbo.

Sculpture.—Surface of the shell marked with fine concentric and less distinct radiating lines; or is smooth.

Size.—Length, 3 mm.; width, 3½ mm.

Horizon and Locality.—From fine gray shales in the Dictyonema beds (Div. 3 *c*) at Navy Island, St. John Harbour.

This little shell is distinguished from those that occur with it (except Acrotreta), not only by its form, but also by the extreme tenuity of its test, thickened only at the umbo. In this also it resembles the shell from Div. 1 *d* referred to above, and those of the genus Acrotreta.

This shell is referred provisionally to *Obolella Belti*, Dav., of the Lower Tremadoc in North Wales,[2] which is about the horizon of our species. Davidson remarked that the "internal characters agree pretty closely with those of *O. sagittalis*." On comparing Davidson's figures of the ventral valves of *O.* (*L.*) *Belti* and *O.* (*L.*) *sagittalis* one may remark differences similar to those which distinguish *O.* (*L.*) *misera*, Bill., from *O.* (*L.*) *transversa*, Hartt., of the St. John Group. In *O. Belti* and *O. misera* the muscular scars are

[1] 'U. S. Geol. Surv. Bull. 30,' pl. x, fig. 2.

[2] 'Geol. Mag.,' vol. v, No. 7, p. 310, pl. xvi, figs. 25–27.

fainter and nearer the back of the shell, and the umbonal callus is smaller than in the other two.

ACROTRETA. Kutorga (1848).

Acrotreta Baileyi. Matt.? (Pl. XII, fig. 7*d*.)

'Trans. Roy. Soc. Can.,' Vol. iii, Pt. iv, p. 36, Pl. 5, figs. 13*a*, *b*, *c*.

A small species which agrees with this in size and in the form of the dorsal and ventral valves, occurs in the upper part of the Dictyonema shale, in company with the Linnarssonia described above. The internal markings of the dorsal valve are distinctly those of an Acrotreta, and the ventral valve has the conical form, with flattened area, characteristic of the genus.

Size.—Full-sized samples are about 3½ mm. long and 4 mm. wide, but many are much smaller.

Horizon and Locality.—In a bed of fine grey shale enclosed in the black slates of Div. 3 *c* at Navy Island, St. John Harbour.

This species differs from *A. gemma*, Bill., of the Levis shale[1] in its larger size, in the less elevated ventral valve, and in the branching internal mesian ridge of the dorsal valve (though this is not a constant character).

G. Lindström records the occurrence of an undescribed Acrotreta in the Ceratopyge limestone of Sweden, which is just above the horizon of this species.[2] Davidson figures and describes a species (*A. Nicholsoni*) similar to this in size and appearance, found in the Llandeilo Group of Dumfriesshire, Scotland.[3]

OBOLUS, *Eichwald.*

M. de Verneuil describes this genus in the following terms :—[4]

"This little genus which Messrs. Eichwald and Pander have decided to separate from the other Brachiopods, it appears to us deserves to be preserved. It is far removed from *Orthis* by the absence of an articulate hinge, by the nature of its test, and by the almost equal valves, deprived of an area and of a triangular slit. It differs also from *Crania*, near which Mr. Eichwald placed it, by the existence of a distinct hinge, also that it is without teeth, by the regularity and equality of its valves, by their thin edges, and even by the substance of the shell. We observe as well as Mr. Pander the closest analogies between those little shells and the Lingulas, but we believe they ought not to be reunited, on account of their transverse form, the width of their cardinal border and the canal with which it is provided."[5]

[Beside *Obolus Apollinis*], "M. Eichwald has established three other species of Obolus,

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[1] "Palæoz. Fossils," vol. i, p. 216, fig. 201; "Palæont. Eureka Dist.," p. 17, pl. i, figs. 1 *a–b* and *d–f*.

[2] "List of the Fossil Faunas of Sweden," i, p. 7.

[3] 'Geol. Mag.,' vol. v, No. 7, p. 313, pl. xvi, figs. 14–16.

[4] 'Russia and the Ural Mts.,' Paris, 1845, vol. ii, p. 290.

[5] This objection does not apply to the genus *Lingulella*, to which these shells are much more closely allied than they are to Lingula. The genus Lingulella was not separated from Lingula until 1861, fifteen years after these remarks were written.

O. Ingricus, *O. Siluricus* and *O. antiquissimus*, which we have not yet seen, but which, according to the descriptions, differ little from the species described below."

"*Horizon and Locality.*—Shells of Obolus are found by millions in the lower sandstones [Cambrian] of the Silurian system of the north of Russia, and there constitute entire beds. Their valves not being articulated are easily disunited, and their fragments lying in the plane of the beds give the rock the appearance of a micaceous sandstone. These shells mark a fixed horizon which serves as an excellent guide to the geology of the entire Baltic Coast * * * but it is remarkable that notwithstanding their extreme abundance they have never been found on the opposite coast of the Baltic, neither in Sweden nor Norway, notwithstanding that sandstones exist there parallel to those of Russia, and inferior in position to the limestone with *Asaphus expansus*, etc. According to M. Eichwald, who has particularly studied the distribution [of Obolus], two species, *O. antiquissumus* and *O. Siluricus*, occur in chloritic limestones, a little higher up than the sandstones."

E. de Verneuil describes *Obolus Apollinis* as follows :—[1]

"Subequivalve equilateral, very flat, orbicular or slightly transverse, having a corneous test, varnished, brilliant, of brown or blackish color. Edges thin, sharp, fragile, and presenting neither inflections nor sinuosities, apex but slightly marked and quite terminal; surface covered with irregular longitudinal striæ, scarcely visible, similar to those of certain Lingulæ, and in part concealed by transverse striæ crossing them.

"Dorsal [ventral] valve at the summit very obtuse, having a flat cardinal beak, transversely striated, at the middle of which one finds an elongated canal, destined without doubt to receive the muscle of attachment, which, as in the Lingulas, passed between the summits of the two valves. This same valve is besides furnished on the inside with a median ridge, terminating in a point as in the Lingulas, and two lateral ridges much more prolonged.

"The ventral [dorsal] valve is a little shorter than the other, more rounded at the hinge, with a cardinal area very large, having a flat surface and not channelled. In the interior several impressions of muscles have been observed.

"*Dimensions.*—Length, 10-12 mm.; width, 12-14 mm."

A species similar to this, but not identical, has been found in the shales of Division 3 of the St. John Group, viz.:—

Obolus refulgens, n. sp. (Pl. XII, figs. 6 *a–d.*)

Entangled with the hydrosomes of Dictyonema and scattered through the shales in which that graptolite occurs there are numerous examples of an orbicular brachiopod, in many respects resembling the Russian species of Eichwald described above, which gave its name to the "Ungulite grit" of Russia.

Shell oblately orbicular, lenticular, edges thin, sharp, flat. Test corneous; surface brilliant.

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[1] Op. cit., p. 291.

Dorsal valve with a very thin cardinal edge turned inward at the hinge. Interior[1] marked by three diverging ridges, of which the central one is longer than the lateral ones. The central ridge when well preserved appears to extend two-thirds of the length of the shell, and is distinct as far as the middle of the shell, where there are two small muscular impressions; at the back of the shell, between the mesian and lateral ridges, are the impressions of the adductor muscles. There is a large, shallow, bilobed depression in the anterior half of the shell. The cardinal border is thin and is made more distinct by a pair of small, narrow, transverse pits on each side of the mesian ridge.

Ventral valve produced at the back into a low rather blunt beak, depressed at the point. In the interior of the ventral valve, there are at the back three ridges, which diverge from the umbo; of these the mesian ridge, dividing the posterior adductor muscles, is short and weak; it is forked at the end (where it terminates against the scar of the pedicel muscle ?). The two lateral ridges are longer, being about a quarter of the length of the shell, and are more distinctly outlined by a long, narrow pit on the inner side. The visceral cavity is wide in front and terminates in a long sinus; some specimens show in this sinus a muscular callosity (perhaps due to the anterior retractor muscle). The hinge area is narrow and deflected downward in the middle to receive the end of the dorsal valve; it is crossed by a shallow pedicel groove.

Sculpture.—The surface is marked by very fine concentric and radiating lines, and there are stronger concentric growth lines at intervals on the surface.

Size.—Length of the ventral valve, 8½ mm.; width, 10 mm.; the dorsal valve is one-half of a millimetre shorter than the ventral.

Horizon and Locality.—In the Dictyonema shales (Div. 3 *c*) Navy Island, St. John Harbour.

In many respects de Verneuil's description of *O. Apollinis* represents the features of the Canadian species, but there are differences. The most notable of these is that our species does not have the broad flat band at the hinge of the dorsal valve (ventral valve of M. de Verneuil); on the contrary, the valve is sharp and narrow edged here. Then also the Canadian species is lenticular in form and not flat, as the Russian species is said to be; this is shown by examples preserved in pyrite. In the Canadian species all the ridges of the interior of the valves, as well as the hinge area, are more delicate than in the Russian.

In many examples of the St. John species one finds the body of the shell lenticular, while the edges are flattened, and it seems to be quite certain that the edges of this shell were not only thin and sharp, but sometimes flexible and liable to be bent back by pressure. It seems also that in some cases there was a flattening of the edges of the valves even in shells which were of a firmer consistancy. Such a flattening would give rise to the appearance represented by de Verneuil in his fig. 3 *d* of Plate XIX.; but this condition is never seen in our species at the hinge of the dorsal, which always stands up with a sharp edge. This part, in fact, juts into the area of the ventral valve, which is made concave to receive it. An instance of a flattened margin is represented at fig. 6 *d*, Pl. XII.

[1] I have not found very satisfactory examples of the markings of the interior of the valves in any one individual; but by combining the markings found on several valves of the dorsal and ventral sides respectively it has been found possible to restore some of the features of the interior of the shell.

ORTHIS, *Dalman.*

Orthis lenticularis. Wahl. (Pl. XII, figs. 9 *a–d.*)

1821—*Anomites lenticularis.* Wahl. 'Petr. Tell. Suec.' p. 66.
1827—*Atrypa? lenticularis.* Dalm. 'Vet. Acad. Handl.,' p. 132; 'His. Leth. Suec.,' p. 76.
1834—*Spirifer? lenticularis.* L. von Buch. 'Abhandl. d. Berl. Acad.,' p. 48. Tab. i, figs. 13-14.
1857 / 1865 } *Atrypa lenticularis.* Kjerulf. 'Geol. d. Südl. Norw.,' p. 284; 'Veiviser,' etc., p. 1-3, fig. 7.
1866—*Orthis lenticularis.* Dav. 'Geol. Magaz.,' vol. v. Tab. xvi, figs. 20-22.
1871—*Orthis lenticularis.* Dav. 'Brit. Silur. Brach.,' p. 230. Tab. xxxiii, figs. 22-28.

The following is Wahlenberg's original description of this species:

"Suborbicular, on each side a little convex, radially undulate. In a 'suillous' rock (fœtid limestone) in beds of aluminiferous slate, in which material no other shell has been found. It occurs plentifully everywhere throughout several provinces. In size and in its situation it resembles at first sight the pea-shaped entomostracan [*Agnostus pisiformis*, which occurs] in the same rock. Each valve rejoices in an equal convexity, so that when united they very much resemble the seed of a lentile. The valves are seen to have been very thin in their substance."[1]

Dalman's description is fuller, and is as follows: "A small species, with very tender and fragile valves. Length about 4 mm., and of about the same, or somewhat greater breadth. An entire specimen is rarely found, but the species is most easily distinguished on account of the stone in which it occurs, as it has scarcely any other species of Terebratulite with it. The shell is suborbicular, with the base somewhat prominent and a little convex; toward the margin it is sensibly compressed. Striæ of undulating lines, lines in number about twenty, but indefinite. Without a yoke [deltidium] or canal to the dorsal [ventral valve?]. In the complete state no transverse furrows have been observed, but deprived of the epidermis [outer shelly layer], the radiating striæ are wanting, and the shell appears concentrically striulate. The true structure of the hinge is not rightly explored, but, on account of the external aspect and its place in the most ancient strata, the species is suspected to belong to the genus *Atrypa*."[2]

Leopold von Buch, in the work above cited, presents us with another view of this species, and from his impressions of its form and relations referred it doubtfully to the genus *Spirifer*. His account is as follows:

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[1] Wahlenberg, Petr. tell., p. 66.—*Anomites lenticularis*—Suborbicularis utrinque convexiusculus, radiatim undulatus. In lapide suillo strati schisti aluminaris per plures provincias passim copiose sedet, in quo lapide nulla alia testacea unquam tecta sunt. Magnitudine et situ entomostraciten pisiformem in eodem lapide provenientem aliquanto refert. Utraque valvula pari convexitate gaudet, adeo ut conjunctæ semina lentis proxime aequent. Valulæ substantia sua tenuissimæ fuisse videntur.

[2] Species parva, valvis tenerrimis et fragilibus. Longit. circiter 4 mm., et ejusdem latitudinis vel ultra. Specimina integra raro inveniuntur. Species vero lapide in quo sedet facillime distinguenda, quum vix aliam terebratulitarum speciem habeat sociam.

Testa suborbicularis basi aliquantum prominula et convexiuscula, versus margines sensim compressa, striæ radiantes læves, underum vistæ (numero circiter 20, l. indefinito). Absque jugo, canali dorsali, statu integro nullæ observantur, striæ transversales, sed epidermidæ detrita striæ radiantes deficiunt, et testa apparent concentrice striolata.

Cardinis vera structura haud rite explorata sed ob faciem externum, et locum in stratis antiquissimis species esse Atrypæ generi suspicatus sum.

"Both shells are slightly elevated; both, however, have a slightly depressed [hollow ?] in the middle opposite each other. The margin is square oval, with sides sloping away, and slightly bending down at the back. The hinge of the ventral [dorsal] shell is straight; in the dorsal [ventral] valve, on the contrary, the edges of the hinge are bent into a very blunt angle. This is the only way by which one can distinguish the valves from each other, for the area, which in itself is very small, lies always on the under edge. The greatest width is in the middle of the length. From eight to ten radiating lines go from the middle point [umbo] out, and increase at the border to from eighteen to twenty lines. Very fine crowded lines of growth cross these and form a very pretty pattern. Length to the width as 100 to 131.

"This little mussel is crowded together in enormous numbers. They build alone the alum shales of Andrarum, in Schona Yes; Dalman relates that such beds occur throughout the whole of West Göttland, and also in several unnamed provinces of Sweden."

Of this species Salter gives the following description, referring it to the genus *Orthis:*

"A well-marked and very pretty species, and the earliest known in British rocks. It is hardly ever more than one-third of an inch wide, and most specimens are not more than half that size. The length is less than the breadth in proportion as seven to nine. Our figures represent the shell as distorted in various positions, but the above is about the average measurement. Both valves are somewhat convex, but the dorsal valve has a broad, central depression of a triangular shape, bounded by two rather prominent ribs out of the ten or twelve strong ones that radiate from the beak, and the sinus is occupied by two subcentral and very distinct ones. The lateral ribs are strongly interlined by others half-way up, the intervening ribs becoming as strong as the primary ones, and these again by shorter and smaller ones in the intervals. All are crossed by strong, and interrupted, but rather wavy ridges of growth, so as to decussate the surface in rather a remarkable way. The other valve is like in sculpture, but has a rather prominent beak. The number of ribs varies greatly, but not in a way to make us believe we have more than one species. Sufficient differences are not seen in the Scandinavian specimens to warrant us in separating these, which occur in abundance in the alum slates in limestone layers.

"The teeth diverge slightly in both valves; in the dorsal valve they are subparallel, and short, or even curved a little inward, and are not thickened; while the cardinal process between them is a mere line or thin edge, which extends as far down as the length of the short lateral teeth, but is often very obscure, and sometimes seems to be altogether absent.

"There is little doubt that this is Dalman's species from Egeberg, though the specimens we have from thence have less prominent ribs and a generally smoother appearance."

If the reader will compare together these several descriptions of this species by the above writers, he will be surprised at the diversity which they exhibit. This diversity, it appears to the writer, is due partly to the imperfect descriptions of the earlier writers, but chiefly to the remarkable variability of the species.

Wahlenberg takes no notice of the difference between the dorsal and ventral valves, for he ascribes to them an equal convexity, and says that the two valves occur together; but Dr. Lindström intimates that they have never been found united, and from the specimens which he has kindly sent me, it is clear that the Swedish variety has the usual sulcus in the dorsal valve, though in some cases only faintly marked. In the typical form of this

species the cardinal area is short and the beak quite low, and as the convexity of the two valves does not differ greatly, this appears to be the form which Wahlenberg had in view when describing the species. Dalman's description, on the other hand, applies best to a variety (*atrypoides*) described and figured by the writer in the sequel. He, like Wahlenberg, appears to describe only the ventral valve.

Leopold von Buch, while recognizing the distinctness of the two valves, ascribes a sulcus to the ventral valve, which apparently has not been observed by any other writer. With this exception, his description applies to the type of the species; that is, the evenly lenticular form with a short hinge line. The extreme thinness of the shell fully bears out Dalman's remarks on this point, and is associated with inconspicuous hinge teeth and dental plates. The internal markings of the shell produced by attachment of the muscles and the ovarian spaces are only faintly indicated and often quite indiscernible.

Sculpture.—There is a wide variation in this respect in examples of different ages and in the different varieties. As a rule the young shells, especially those of the ventral valve, are smooth, with only slightly marked diverging ridges. In the Acadian examples of this species the sculpturing is always more distinct on the dorsal than on the ventral valve; this I find also is the case with the Swedish examples, for which I am indebted to Dr. Lindström.

As the shells grew larger the ribs became more distinct and also more numerous by the intercalation of new ribs towards the margin. Leopold von Buch gives 18 to 20 as the full number of ribs in the adult. This is the usual number in the St. John examples, though a few show as many as 30.

Size.—The largest example of this species observed at St. John is 8 mm. long and 11 mm. broad, but Brögger mentions that an example from Töien, Vestfossen, was 10·5 x 12·5. Dr. Lindström has not seen any so large. A medium size of shell, about 5 x 6 mm., is by far the most common in the Acadian rocks.

Horizon and Locality.—This species is found in limestone lentiles, enclosed in the black shales of Division 3 *a*, at Germaine street, St. John, occurring together, as in Sweden, in great numbers and of all sizes.

VARIETIES.

Associated with the typical form of this shell are a number of allied forms, which might at first be thought to be distinct species, but which by intermediate forms, and especially in the young shells, seem to run together. Dalman says that in Sweden "no other form of Terebratulite is found with this species," and as the forms found in Acadia are perhaps but varieties of one species, they are thus described here.

Var. *atrypoides*. (Pl. XII, figs. 11 *a* and *b*.)

This form is comparatively smooth, though the ventral valve is sometimes concentrically wrinkled. This valve is distinguished by a median ridge and somewhat flattened sides, and the dorsal valve has an unusually deep sinus. *Size* of the known examples 6 x 6 mm., and 5 x 6 mm. for the two valves.

Var. *lyncioides.* (Pl. XII, figs. 10 *a–c.*)

Distinguished by its sharp, strong, radiating ribs, large umbo and high cardinal area. In some of the larger examples the radiating ribs become subordinate to and are replaced on the newer part of the shell by concentric striæ, reversing the usual position of the ribbed and the smooth parts of the shells of this species. *Size* of the valves about 6 x 8 mm.

Var. *strophomenoides.* (Pl. XII, figs. 12 *a* and *b.*)

This form shows very few radiating striæ, except on the dorsal valves, on which they are faintly shown. The valves are concentrically wrinkled like those of *Strophomena rhomboidalis*, but not in so distinct a manner. The ventral valve is abruptly bent down on the sides and front about one-third from the outer margin; this valve when young is flat and the umbo is more pointed than at a later stage of growth. *Size*, 4·5 x 6·5 mm., and 5· x 6·5 mm. for the dorsal and ventral valves respectively.

These abberrant forms of *O. lenticularis* possess considerable interest in connection with the question of the development of new genera from older types of brachiopods. Not that an Atrypa, a Platystrophia or a Strophomena necessarily sprung from this species, but they show the power of the Orthid type to develop such genera and sub-genera.

Mr Billings described a Strophomena (*S. aurora*) from a band immediately below the beds with Phyllograptus in Newfoundland, and Dr. Brögger a variety of *S. rhomboidalis* as low down as the *Asaphus expansus* shale in Norway, or close to the base of the Ordovician system.

ORTHISINA, *d'Orbigny.*

Orthisina (?) johannensis, n. sp. (Pl XII, figs. 13 *a–c*).

Shell subquadrate, doubly convex, rather flat, very thin.

Dorsal valve depressed at the sides and front, and having a broad, shallow median sinus. The valve is about one-quarter wider than long, and the hinge-line is nearly as long as the length of the shell. Umbo slightly elevated, hinge-plate weak and thin.

Ventral valve depressed at the sides, and having a few median ridges running from the umbo to the front of the shell. This valve is somewhat geniculated at two-fifths of its length from the umbo, and from the bend faintly raised ridges diverge to the anterior angles of the shell; behind the geniculation the surface of the shell is marked by faint undulations similar to those of *Strophomena rhomboidalis.*

The umbo is not prominent, but the back of the valve is regularly curved and the area rather low.

Sculpture.—Closely set striæ radiating from the umbo, and faint concentric striæ mark the shell.

Size.—Length of the ventral valve, 9 mm.; width, 10 mm. Length of dorsal, 8 mm.; width, 10 mm.

Horizon and Locality.—Limestone lentiles in the black shales of Division 3 *a*, Germaine street, St. John.

This species has a low umbo for an Orthisina, and in its form recalls the genus *Strophomena*, as also do the concentric undulations that are found on the back of the ventral valve. The dorsal valve, however, is convex, and the area of this and the ventral valve too high for a Strophomena. It does not appear to agree with any described species of Orthisina. It resembles *O. orientalis*, White, somewhat in form, but is not so long nor so wide at the hinge. From *O. pepina*, Hall, it differs in its lower umbo and area, shorter hinge and smoother surface. It approaches more closely to the form from the Potsdam Sandstone of the West, figured by Prof. Hall but not named, except as a "Strophomena or Strophodonta."[1]

AGNOSTUS.

Agnostus bisectus, n. sp. (Pl. XIII, figs. 2 *a* and *b*.)

Body oval, somewhat quadrate behind. Crust smooth.

Head shield somewhat wider than long. Marginal fold of moderate width. Cheeks wide, connected in front. Glabella of two lobes, the anterior short, rounded in front; the posterior prominent, elevated behind. Basal lobes small, subtriangular.

Pygidium subquadrangular, rounded behind. Marginal fold with two lateral spines. Lateral lobes of nearly equal width all around. Rachis divided into two lobes of nearly equal length, the anterior sloping up from the front to a tubercular point, the posterior sloping rapidly back to a rounded termination. The obsolete anterior lobe is represented by two small lateral lobes, one on each side of the anterior end of the rachis.

Size.—Length of the body, 7 mm.; width, 3 mm.

Horizon and Locality.—In the black shales of Div. 3 *b* at Navy Island, St. John.

This little species of the section Limbati is of interest as another connecting link by which the earlier Limbati of the Paradoxides beds were connected with those of the Ordovician system. *A. fallax* of Sweden and *A. vir* of Acadia are two of the earlier forms; the latter is represented in the fauna of Div. 1 *d* by var. *concinnus* and *A. fallax* by var. *minor* near the same horizon in Sweden. But the type is wanting in the Olenus beds of Sweden, and appears again with us in Acadia in this species (*A. bisectus*). The type reappears in Sweden at a higher horizon in the species *A. Sidenbladhi*, Lnrs, of the Ceratopyge limestone. From this species the Acadian one differs in having only two lobes in the pygidium. Had the tubercle on the anterior lobe of the rachis of the pygidium in our species extended forward as a narrow elongated lobe to the front of the pygidium, our species would have been almost exactly *A. Sidenbladhi*, both in size and ornamentation.

In the Calciferous and Chazy limestone and shales (M and N) of northern Newfoundland occurs Billings' species *A. Galba*, which is closely allied to *A. Sidenbladhi*, differing very little except in the absence of marginal spines, and these are very apt to be overlooked. This carries the type up to the Ordovician system.

In the Ordovician system, in the Expansus Shale, occurs Angelin's species *A. glabratus*, also of the Limbatus type. This differs from the Acadian species herein described, in having no lobes in the glabella and having a tapering rachis to the pygidium.

In the Caradoc or Bala limestone of Wales a later phase of the Limbatus type of

[1] "Preliminary Notice of the Fauna of the Potsdam Sandstone," plate vi, fig. 22.

Agnostus appears in Salter's *A. trinodus*, in which the lobes of the rachis are arranged as in the Acadian species here described, but the shape of the rachis is quite different.

Arranged chronologically these several species would fall in the following succession: *A. fallax, vir,* BISECTUS, *Siden bladhi, Galba, glabratus, trinodus.*[1]

PARABOLINA, *Salter* (1849).

PARABOLINA SPINULOSA. Wahl. (Pl. XIII, figs. 5 *a–d.*)

1821—*Entomostracites spinulosus.* Wahl. 'Pet. Tell. Suec.,' p. 38. Tab. i, fig. 3.
1822—*Paradoxides spinulosus.* Brongn. 'Crust. foss.,' p. 32. Tab. 4, figs. 2 and 3.
1827—*Olenus spinulosus.* Dalm. 'Om Palæad,' p. 256.
1838—*Trilobitis gibbosus.* Wahl. var. 'Bœck, Gæa. Norv.,' p. 143.
1843—*Paradoxides spinulosus.* Burm. 'Org. d. trilob.,' p. 80.
1854—*Parabolina spinulosa.* Ang. 'Palæ. Scand.,' p. 46. T. xxv, fig. 9.
1857—*Olenus spinulosus.* Kjerulf. 'Geol. d. südl. Norw.,' p. 284.
1865—*Parabolina spinulosa.* Kjerulf. 'Veiviser,' etc., p. 2.

A few well marked examples of this species occur in a limestone lentile with *Orthis lenticularis* about one hundred feet from the base of Division 3. The most important parts of the body are preserved and justify the reference to this species.

A pygidium of a young individual shows shorter spines than those of the adult of the European form of this species.

Horizon and Locality.—Black shales of Div. 3 *a* at Germaine St., St. John.

PARABOLINA HERES. Brögger.

Parabolina heres. Brög. 'Die Silurischen, Etagen 2 und 3,' p. 101. Tab. i, fig. 13 *a–d.*

Var. *lata* n. var. (Pl. XIII, figs. 6 *a–f.*)

This form is a near relative of *Parabolina heres*, Brögger, but differs in the following respects:—

Headshield—In this the glabella is much broader in proportion to its length, and the fixed cheek also is broader behind. Movable cheek—This in form resembles that of *P. spinulosa* rather than *P. heres*, and the posterior border is at right angles with the marginal fold and spine.

Pygidium—This has four joints in the rachis and only three spines on each side at the border; the joints of the rachis appear to be devoid of spines.

Hypostome—It is in this part that the most important difference consists. If we are right in referring here a hypostome found with this species, it differs considerably from the other hypostomes of this genus known, but among those hypostomes it is nearest to that of *P. heres.*[2] Two examples are known, neither of which are perfect. The form is trapezoidal, with a short spine on each posterior corner. The front is not complete, but appears to be broadly oval, owing to the projection of the lateral lobes; these are comma shaped, and

[1] Since writing the above I have noticed that Dr. Brögger has written on the relationship of these species.
[2] Die Silurischen Etagen 2 und 3. Tab. ii, fig. 13 *a.*

have a low ridge along the centre; they are divided from the anterior lobe by a strait furrow running backward and outward. The central body is conical with rounded corners; it consists of an oval anterior lobe, pointed behind, and two crescent shaped posterior lobes. Behind these lobes is a broad posterior fold terminated at each extremity by a short spine directed outward; this part appears to have been under the occipital ring.

A young individual of this variety, 8·5 mm. long, complete, except for the absence of the movable cheeks, shows some differences from the adult. The glabella is proportionately longer and narrower, and there is a somewhat wider space between the glabella and the anterior marginal fold. This individual had ten joints in the thorax, of which the six anterior ones were furnished with tubercles on the rachis. These tubercles were not noticed on all the front joints of adult thoraces, and perhaps tend to become obsolete during growth.

Sculpture.—The appearance of the surface of the test in this variety is much the same as in *P. heres.*

Size.—Middle piece of head, length, 7½ mm.; width, 14 mm. Movable cheek, length (including spine), 11 mm.; width, 3½ mm. Hypostome supposed to belong to this species, length, 6½ mm.; width, 7 mm. Pygidium, length, 4 mm.; width, 8 mm.

Horizon and Locality.—In the black slates of Div. 3 *b* at Navy Island, St. John Harbour.

This variety differs from the typical form, as figured by Brögger, in having a proportionately wider glabella and fixed cheeks, and in having one joint less and one pair of spines less in the pygidium.

Var. *grandis*, n. var. (Pl. XIII, fig. 7.)

A pygidium which is large enough to be that of *Peltura scarabeoides*, but does not agree with those figured for that species, was found in the same bed with the above species.

Form semicircular, enclosed by a border fold, armed on each side with three or four slender spines.[1] Rachis broad, of four segments, of which the first bears a small tubercle. Side lobes with three ribs, creased diagonally by furrows; the side lobes meet behind the rachis.

Size.—Length, 8 mm.; width, 15 mm.

Horizon and Locality.—In the black shales of Div. 3 *b* at Navy Island, St. John Harbour.

This pygidium in its features is intermediate between that of *Parabolina heres* (type) and *Protopeltura acanthura* (type). It has one joint less in the rachis than the former, and one more than the latter. The broad rachis is like that of *Protopeltura*, but the more numerous joints of the rachis, and the very slender spines on the margin, seem rather to ally it with the above Parabolina. The outline of the margin is quite different from that of the pygidium of *Peltura scarabeoides*, and there is one joint more in the rachis than in that species.

[1] From the position of four spines at the back of the pygidium it is inferred that there are probably two others on each side towards the front.

PROTOPELTURA (sub. gen.), *Brögger.*

PROTOPELTURA ACANTHURA. Anglin.

Olenus (?) acanthurus. Ang. 'Pal. Scand.,' p. 44. Tab. xxv, fig. 7.
Protopeltura acanthura. Brögg. 'Silurisch. Etag., 2 und 3,' p. 106. Tab. i, fig. 14. Tab. ii, fig. 13 *a*.

Var. *tetracanthura*, n. var. (Pl. XIII, figs. 8 *a–c*.)

This form is near *Olenus acanthurus*, but differs in the following respects:

Middle piece of the head.—In this the glabella is larger in proportion, and comes in contact with the anterior marginal fold.

Movable cheek.—This is proportionately longer.

Pygidium.—This is proportionately longer and narrower; in place of three joints in the rachis it has four, and the three anterior joints bear tubercles; in the place of three spines on the margin of the pygidium on each side, there are only two, one at the anterior angle of the pygidium and the other half way to the distal end; a pair of furrows on the surface of the pygidium are bent and run toward each of these spines.

Sculpture as in *P. acanthura;* there are wrinkles diverging from the ocular fillets to the anterior marginal fold.

Size.—Middle piece of the head, length, 6 mm.; width, 9 mm. Movable cheek, length, 8 mm.; width 2½ mm. Pygidium, length, exclusive of the spines, 5 mm.; width, 8 mm.

Horizon and Locality.—In the black shales of Division 3 *b*, Navy Island.

A head similar to this is found in Division 3 *a* at Germaine street, St. John, but the pygidium is not known.

This variety and *P. acanthura* are remarkable for their large pygidia.

PELTURA, *Milne Edw.* (1840).

PELTURA SCARABEOIDES. Wahl. (Pl. XIII, figs. 9 *a* and *b*.)

1821—*Entomostracites scarabeoides.* Wahl. 'Petrif. Tell. Suec.,' p. 41. T. i, fig. 4.
1822—*Paradoxides scarabeoides.* Brongn. 'Hist. nat. des Crust. foss.,' p. 34. T. iii, fig. 5.
1827—*Olenus scarabeoides.* Dalm. 'Om palæaderma K. Vet. Akad. Handl. 1826,' p. 72.
1840—*Peltoura scarabeoides.* Miln. Edw. 'Hist. nat. des Crust.,' tom. iii, p. 344.
1847—*Peltura scarabeoides.* Corda. 'Prodr. einer Monog. der Böhm. Trilob.,' p. 127. T. vi, fig. 68.
1854—*Peltura scarabeoides.* Ang. 'Pal. Scand.,' p. 45. T. xxv, fig. 8.
1854—*Anopocare pusillum.* Ang. 'Pal. Scand.,' p. 50. T. xxvii, fig. 1 *a*.
1864—*Olenus scarabeoides*, var. *obesus.* Salt, 'Mem. Geol. Surv. G. B., Dec. xi.' T. viii, figs, 1-4 and 5.
1866—*Olenus scarabeoides.* Salt. 'Mem. Geol. Surv. G. B.,' vol. iii, p. 301. T. v, figs. 2-5.
1871—*Conocephalites Malvernensis.* Phil. 'Geol. Oxford,' p. 68, fig. 5.
1871—*Olenus scarabeoides.* Phil. Loc. cit., p. 68, fig. 6.

Remains of this species occur sparingly in the black slates of King-street and of Navy Island at the horizon Division 3 *b*. It has been found more plentifully in Cape Breton.

LEPTOPLASTUS. Angelin.

An example of this peculiar genus of trilobites, rare outside of Scandinavia, has been found in Division 3.

Angelin seems to have thought this genus an important one, as he made it the type of a family, *Leptoplastidæ*, in which he included Olenus, Parabolina, Peltura, Acerocare, Eurycare and Sphærophthalmus. Leptoplastus was probably regarded by him as a link between the first four of these genera and the two last, and thus most suitable for the family type. Within the genus there are species that ally it to Olenus and Peltura on the one hand, and to Sphærophthalmus and Eurycare on the other.

The most obvious distinction between Leptoplastus and Olenus is in the position of the eyes, which in the latter genus are in advance of their normal position in trilobites. There are other differences, as the number of segments in the thorax, form of pygidium, etc., not easy of recognition when the trilobites are dismembered.

In Leptoplastus the head is more strongly vaulted than in Olenus and its allies, and the genal spines more flaring. Dr. Brögger has thought it advisable to assemble the vaulted species under Leptoplastus as a generic name, making Eurycare, Sphærophthalmus and Ctenopyge subgenera, thus recognizing the value of Leptoplastus as a centre for this group of forms.

Angelin's description of Leptoplastus was as follows :

Corpus oblongatum vel ovatum, distincte longitudinaliter trilobum, crusta lævissimum præditum.

Caput semilunare, undique anguste marginatum, sulcoque intramarginali ; anguli exteriores spinis brevibus armatis. Oculi modici, semilunares distantes, centrales, lobi orbitali præditi. Costæ faciales obliquæ. Frons breviuscula, ovata, sulcum marginalem haud attingens.

Thorax segmentis 11–12 longitudinaliter sulcatis, apice accuminatis.

Abdomen parvum, margine armatum vel muticum ; rachis distincta, marginem subattingens.[1]

Leptoplastus latus, Matt. (Pl. XIII, figs. 10 *a–c*.)

Leptoplastus latus, n. sp. 'Can. Rec. Sci.,' 1891, p. 462, figs. 1, 2 and 3.

Body without the movable cheeks, suboval. Crust smooth.

Head strongly arched downward in front, and (including the movable cheeks) about four times as wide as long. *Centre-piece* of the head subtrapezoidal in outline ; anterior margin straight, having a fine thread-like fold. Glabella prominent, short, cylindrical, broadly rounded in front, reaching the marginal furrow ; there are two pairs of furrows, very faint, arching backward from the sides of the glabella and extending about one-third across ; occipital furrow distinct, extending all across ; occipital ring rounded, and rounded forward at the ends ; it bears a small median tubercle. *Fixed cheek* broad, tumid, crossed obliquely one-third from the front by a faint ocular fillet ; eyelobes prominent, broadly ovate ; posterior marginal fold very faint, and rounded forward to the eyelobe. *Movable cheek* tumid, rudely lozenge-shaped, broadly rounded on the outside, and

[1] *Body* oblong or ovate, distinctly three-lobed lengthwise, with a very smooth crust.

Head semicircular, narrowly margined all around, and having a groove within the margin ; exterior angles armed with short spines. Eyes of moderate size, semicircular, distant, central, furnished with orbital lobes. Facial ridges [ocular fillets ?] oblique. Glabella rather short, ovate, scarcely reaching the [anterior] margin.

Thorax of 11–12 segments, grooved lengthwise, and having the apex acuminate.

Pygidium small, spined, or smooth on the margin ; rachis distinct, scarcely reaching the margin.

extended into a short spine directed outward; inner side of the cheek with an arched border in front, emarginate for the eye, and very short behind the eye; posterior side of the cheek nearly straight, with an obsolete border fold. *Facial suture* arching forward and inward from the eyelobe to the anterior margin, and directed backward from the eyelobe to the posterior margin.

Thorax with a broad and prominent rachis of about twelve (?) narrow segments, rapidly narrowing in the posterior half. *Pleuræ* shorter than the joints of the rachis, crossed diagonally by a sharp narrow furrow; extremity of the pleura pointed and extended into a sharp spine, directed backward.

Pygidium small, narrowly semicircular, having a prominent rachis and three joints; side lobes narrow, with two ribs, the whole encircled by a distinct border fold.

Size.—Centre piece of the head, length, 3½ mm.; width, 7 mm. Movable cheek, length, 6 mm.; width, 2½ mm. Pygidium, length, 1¼ mm.; width, 2½ mm.

Horizon and Locality.—In calcareo-silicious layers in black shale of Div. 3 *b* at Navy Island, St. John Harbour.

Var. (Pl. XIII, fig. 11.)

A variety with more distinct furrows on the glabella, wider front margin, and broader occipital ring and posterior margin, is found with the preceding.

Among Angelin's three species of Leptoplastus, *L. ovatus* is the one which most resembles this species; that species, however, has a series of spines along the rachis, and has an extended dorsal suture behind the eyes, and thus differs from the Acadian species.

CTENOPYGE, *Linrs.*

In the black slates of the Bretonian Division (Div. 3) there are locally immense numbers of minute trilobites, which appear to represent in the economy of Nature the swarms of Agnosti that are found in the fine shales of the Acadian Division (Div. 1), and were there buried in the fine mud that entombed the Paradoxides. These trilobites, though so small, are of higher organization than the Agnosti, if one may judge by the number and complexity of the parts of which their skeletons were composed.

We are almost wholly indebted to the Scandinavian geologists for the elucidation of the structure and relationship of these little trilobites. First Angelin, whose classification has been alluded to under the genus Leptoplastus, and then Linnarsson took up the study of these forms. The latter added a number of new species to the group, and instituted the genus Ctenopyge, to contain the peculiar form *C. pecten* and others. Still later, Dr. W. C. Brogger made a careful analysis of this group, and proposed to class it under one generic title—Leptoplastus. While not prepared thus to reduce the genera of Salter, Angelin, Linnarsson and Phillips that are included in Brögger's genus, his generic description is such an excellent digest of the characters of the group that it should be presented here, as it serves as a basis on which to arrange the several genera.

Leptoplastus, Angelin, as amended by Brögger to cover also the genera Eurycare, Sphærophthalmus and Ctenopyge, is as follows:

Body oblong ovate, distinctly trilobed lengthwise, covered with a smooth crust.

Head convex, semicircular or short, transverse, bordered all around, and having a groove within the border, more or less emarginate in front. Glabella subcylindrical ovate, or conical, distinctly lobed, generally touching the front border. Ocular fillets oblique, extending back to the eyes.

Fixed cheeks sloped downward in front of the ocular fillet, bent down outwardly behind the eyes, having the posterior margin for the most part sinuate forward, with the sides compressed. Eyes generally minute, placed in the middle of the cheeks, or more toward the posterior margin, sometimes far distant [from each other?]. Facial suture converging in front from the eyes, behind the eyes diverging more or less to the posterior margin outward, obliquely sinuate deflexed. Exterior angles of the head, on account of the posterior margin, for the most part are decidedly set forward; they are produced in short spines or very long arched ones.

Thorax having the rachis for the most part narrow, and having grooved pleuræ with the inner part straight, short acuminate at the ends, or (especially in the posterior part of the body) geniculated, and produced in very long reflexed spines.

Pygidium small, entire or armed with little spines.

	Head moderately transverse produced at the angles into short spines.	Head for the most part strongly transverse produced into long spines.
SECTION I.		
Pleuræ short, acuminate. Pygidium minute for the most part armed with short spines, transverse.	Subgenus Leptoplastus (sens strict.)	Subgenus Eurycare
SECTION II.		
Pleuræ in the posterior part of the body geniculated at the apex, reflected in long spines. Pygidium small, entire (or?) longer.	Subgenus Sphærophthalmus.	Subgenus Ctenopyge

Of these four genera we have recognized in the St. John Basin only Leptoplastus and Ctenopyge. The latter genus was originally confined by Linnarsson to four species, *C. pecten*, *bisulcata*, *teretifrons* and *concava*. To these under the classification given above Dr. Brögger has added *C. flagillifer* and *C. spectabilis*. Representatives of these two species have been found in the St. John Basin, and also imperfect remains that appear to belong to *C. pecten*.

CTENOPYGE FLAGILLIFER, Ang. var. (Pl. XIII, figs. 12 *a* and *b*.)

1854—*Sphærophthalmus flagillifer*, Ang. 'Pal. Scand.,' p. 49. Tab. xxvi, fig. 7.
1880—*Sphærophthalmus flagillifer*, Linrs. 'Försteningarne med Peltura,' etc., p. 12. Tafl. i, figs. 13–17.
1882—*Ctenopgye flagillifer*, Brög. 'Die Silurischen Etagen 2 und 3,' p. 120. Tab. ii, fig. 15 *a*, *b*, 16, 17.

A variety of this species occurs abundantly in some limestone lentiles of Division 3 *b*. It is distinguished from the Swedish form, figured by Linnarsson in having no area between the glabella and the anterior marginal fold, and from the Norwegian form described by Brögger by the position of the genal spine on the movable cheek. In the

example figured by Brögger the genal spine is close to the posterior termination of the dorsal suture, but in the Acadian and also in the Swedish form the spine is placed opposite the middle of the cheek, and in fact in some of the Acadian examples is nearer the anterior than the posterior end of the cheek.

Sculpture.—The surface is minutely granulated.

Size.—Middle piece of the head shield, length, 3 mm.; width, 6 mm. Movable cheek, length, 3 mm.; width, 2½ mm. Length of genal spine, 2 mm.

Horizon and Locality.—In limestone lentiles of Div. 3 *b* at King Street, St. John.

Var.

Occurring in the same fragments of limestone which hold *S. flagillifer* is a variety which presents constant marks of difference. The glabella is broader, and has more distinct furrows, the posterior furrows in place of being transverse, as in the type, are arched backward as in the next species, but they do not as in that, cause the surface of the glabella to be corrugated, nor are they as in it, heavily impressed at the sides of the glabella. On the contrary, they begin at some little distance from the edge of the glabella, and are equally impressed all along. The head shield resembles that of *Eurycare angustatum*, Ang., as figured by Brögger (l.c. Tab. xii, fig. 3), but differs in being emarginate in front of the glabella, and the glabella also is not so completely semicircular in front. This variety may be the broad form of *S. flagillifer*.

Ctenopyge spectabilis. Brög. var. (Pl. XIII, figs. 13 *a* and *b*.)

1882—*Ctenopyge spectabilis.* Brög. 'Die Silurischen,' Etagen 2 und 3. Tab. ii, fig. 18 *a–b*.

The most noticeable of the species of trilobites in the limestone lentiles of Division 3 *b* is Brögger's species above named. Being larger than *S. flagillifer*, though not nearly so large as the example figured by Dr. Brögger, it more readily attracts the eye. There are some points of difference between it and the type beside the obvious one of size. I do not find that the genal spine in the Acadian variety is as long, and there is also a difference in the proportionate width of the glabella, which in the Acadian form is wider than in that from Norway, and the middle furrow of the glabella is more transverse.

Comparing the two Acadian species, I see little difference between the cheek of this species and that of *C. flagillifer*. The cheek is perhaps less tumid and the genal spine more slender. The glabella, in addition to its more angular form and larger size, is more prominent in front, where also the anterior marginal fold is thickened and separated from the glabella by a very narrow area. The two strongly impressed glabellar furrows, directed backward, as well as the third or anterior furrow, also distinguish this species from *S. flagillifer*.

Sculpture.—Surface minutely granulated.

Size.—Head-shield, middle-piece, length, 5 mm.; width, 9 mm. Movable cheek, length, 4.5 mm.; width, 3.5 mm. Length of genal spine, 3 mm. or more.

Horizon and Locality.—In the limestone lentiles of the black shale of Division 3 *b* at King-street, St. John.

? CTENOPYGE PECTEN. Salt.

Certain layers in the limestone lentils abound with slender detached spines that may belong to this species, and on one of them was found a fragment of a rachis which apparently was a part of the pseudo-pygidium of this species; it has several joints, and the side is obliquely furrowed with several short furrows, like that part of this species.

CONOCEPHALITES, *Adams.*

CONOCEPHALITES (?) CONTIGUUS, n. sp. (Pl. XIII, figs. 14 *a* and *b*.)

Occurring sparingly among the species found in the limestone nodules of the black shales, there are a few heads of a small species of Conocephalites. The test was very thin and flexible and no perfect head has been recovered.

Middle-piece of the head arched downward in front; marginal fold straight and narrow and in contact with the front of the glabella. Glabella narrowly conical, truncate in front, impressed by three pairs of furrows, the posterior pair directed backward and connected on the axis of the glabella, the two anterior pairs short. Fixed cheek wide in front, traversed obliquely by a distinct ocular fillet. Occipital ring separated from the glabella by a strong furrow and bearing a median tubercle. Ocular lobe opposite the posterior two-thirds of the glabella and about half its width from it. Posterior marginal fold narrow.

Sculpture.—Surface smooth.

Size.—Middle-piece of the head, length, 4 mm.; width in front of the eyes, 6 mm.

Horizon and Locality.—From the black shales of Division 3 *a* Germaine street and 3 *b* King-street, St. John.

Of this species only a few heads have been found. *Sphærophthalmus majusculus* of the Swedish Peltura beds resembles this species, but has only one light furrow on the glabella. It also is somewhat like *C. Wirthi* of the fauna of Hof, in Bavaria, but in that species the glabella and marginal fold are separated by an area. The nearest species appears to be *C. quadrans* (or *quadriceps*), Dames, of the fauna of Liau Tung, China.

(B.) SPECIES FROM LOWER HORIZONS.

On reexamining the outcrops on Kennebecasis River, and studying some fresh material from there, it is found that the fossils of Long Island, in that river, should probably have a lower position in the Cambrian beds assigned to them. Both in this basin and in that of the Long Reach the sedimentation has been different from that of the St. John Basin, especially in the Johannian Division (Div. 2). In these interior basins this division is much thinner, and shales take the place of flags to a considerable extent. Two fossils from the Long Island beds were described in 'The Canadian Journal of Science.' These are here more fully described, and some other species added.

LINGULELLA, *Salter.*

LINGULELLA STARRI var. MINOR. (Pl. XII, figs. 5 *a* and *b*.)

This neat little species is referred to *Lingulella Starri* on account of the sculpture,

though it is different both in form and size. It is only about two-thirds of the size of that species, and is more prolonged in front. The dorsal valve also is ovate, not oblately orbicular as in the type.

The sculpture consists of concentric ridges, which appear crenulated, owing to interrupted, faint, radiating ridges that transverse them. At intervals there are stronger concentric lines marking stages of growth. The ridges are not so sharply marked as in *L. Starri*, and the shell is much thinner.

Size.—Length of the ventral valve, 11 mm.; width, 9 mm. The dorsal valve is 1 mm. shorter.

Horizon and Locality.—From slaty layers in grey flags of Div. 2 at Long Island, Kennebecasis River.

This species is near the size of *L. lepis*, Salt., and like it is sharply acuminate, but it is a longer shell and has not the sharply striate surface of that species. None of the species of the Potsdam Sandstone described by Prof. Hall agree with this form.

AGNOSTUS, *Brongn.*

Agnostus pisiformis. L. var. (Pl. XIII, figs. 1 *a* and *b*.)

The following diagnosis of this species is from Tullberg's "Agnostus Arterna":—

Crusta lævis. Limbus non angustus. Caput rotundatum, latum. Frons non longa, biloba. Lobus anterior rotundatus. Lobus posterior supra medium puncto elevato ornatus, postice rotundatus. Lobi basales subtriangulares. Genæ ante frontem linea separatæ. Pygidium latum rotundatum, bidentatum. Rachis lineolis vix visibilis triarticulata, postice fere rotundata. Articulus medius postice puncto elevato præditus. Lobi laterales pone rachin non separati, postice angustati.

Long. et lat. clypeorum, 5 mm.

Tullberg comments on this description as follows:—Crust smooth. Border fold rather broad, furnished with two spines on the pygidium. Glabella two-lobed; the forward lobe rounded; the back lobe with a tubercle in front of the middle; basal lobes rounded triangular. Cheeks divided in front of the glabella by a furrow. Pygidium broad, rounded. Rachis not plainly articulated, equal sized, almost rounded behind. The middle joint furnished on the middle with an elevated point. Side lobes not divided behind the rachis.

These descriptions agree fairly well with an Agnostus which occurs in the shales north of the flags of Division 2 on Long Island, but not entirely, nor does the species entirely agree with the figures of Linnarsson[1] and Tullberg.[2]

Our variety has a more distinctly lobed rachis in the pygidium and a larger tubercle or point on the middle joint; the third joint also is narrower and more tapering.

Size.—Only a few individuals of the size of 5 mm. to each shield were found, but a large number of about half the length and smaller.

Horizon and Locality as stated above.

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[1] 'Om Vestergotlands Camb. och Silur. atlag.' Taf. ii, fig. 50 and 51.

[2] 'Agnostus Arterna,' Tullberg. Taf. ii, figs. 14 *a* and 14 *b*.

A variety occurs in which the rachis of the pygidium is longer, and the tubercle on the middle lobe stretches across the lobe.

The range of *Agnostus pisiformis* in Sweden, according to Tullberg,[1] is in the lower part of the Olenus Zone, and this is confirmed by Brögger. The Paradoxides beds below show no trace of it. But in the opposite direction it is represented by the variety *socialis* in the upper part of the Olenus beds. This variety has an enlarged posterior lobe to the rachis of the pygidium, and Tullberg says is a transitional form leading to *A. cyclopyge*, which occurs a little higher up, just below the horizon of *Parabolina spinulosa*. *Agnostus pisiformis* and its derivative forms thus occurs in Sweden in beds that are equivalent to our Johannian Division (Div. 2).

If we suppose that *A. pisiformis* originated from one of the Longifrontes of the Paradoxides beds (e.g., *A. intermedius*), it will be noticed that the Acadian variety agrees more nearly with these older Longifrontes than the typical form of *A pisiformis* (or its derivatives) does. These considerations point to the base of the Olenus Zone as the place of the Acadian variety.

ANOMOCARE, *Angelin.*

In the 'Canadian Record of Science,' October, 1889, the writer described two species of trilobites from Long Island, under the genus Leptoplastus, Ang. Since then, having obtained better material for these species, and having discovered in the St. John Basin a typical Leptoplastus, the writer is of the opinion that these species should be referred to Anomocare.

Anomocare was described by Angelin in the following terms[2] :—

Corpus oblongum, convexum, distincte longitudinaliter trilobum, crusta lævi, excavato-punctata, aciculata, vel alutacea tectum.

Caput semilunare, sagittatum, margine plano, sulcoque intramarginali, aut immarginatum; anguli exteriores producti, acuminati. Frons subangusta, ovata vel oblongula, marginem apicalem haud attingens, utrinque lineis impressis lobata, lobis decrescentibus. Oculi majusculi, distantes medium versus frontis siti, loboque orbitali marginato præditi. Sutura facialis postice ab oculis oblique ad marginem basalem, anticeque ad marginem apicalem decurrens.

Thorax constat e segmentis 10—angustatis, sulco pleurico extrorsum evanescente canaliculis; apice obtusiusculus; rachis angusta, convexa.

Abdomen rotundatum, plerumque impressione intramarginali lata præditum; rachi distincta, angusta, ante apicem scuti desinente; costis lateralibus ante marginem evanescentibus.[3]

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[1] 'Agnostus Arterna,' p. 9.

[2] 'Palæon. Scand.,' p. 24 *bis*.

[3] *Body* oblong, convex, distinctly trilobed lengthwise; covered with a smooth, excavato-punctate, aciculate or coreaceous crust.

Head semicircular, arrow-shaped, margin flat, grooved within the margin, or without a marginal fold; exterior angles produced, acuminate. Glabella rather narrow, ovate or somewhat oblong, scarcely reaching the front margin, lobed on each side by impressed lines, the lobes decreasing. Eyes rather large, distant, situated opposite the middle of the glabella, furnished with a marginal orbital lobe. Facial suture running backward from the eyes obliquely to the basal margin.

Thorax made up of 10— segments narrowed, channelled with a pleural groove that vanishes toward the end, and rather blunt at the end; rachis narrow and convex.

Pygidium rounded, usually provided with a broad intramarginal depression; rachis distinct, narrow, terminating within the apex of the shield; lateral costæ vanishing within the margin.

Dr. W. C. Brögger, who has revised Angelin's arrangement of Leptoplastus and its allies, has so extended and improved the description of this genus that our species cannot be included, and, notwithstanding their small size, they appear to come nearer to Anomocare than to any other genus. This is seen if we notice how the cheeks are produced backward, and that the pygidium has a broad border band and a narrow, many-jointed rachis. For these reasons also the two species seem to belong to this genus rather than to Ptychoparia or Liostracus.

Anomocare stenotoides. Matt. (Pl. XIII, figs. 3 *a–d.*)

Leptoplastus stenotoides. 'Can. Rec. Sci.,' Oct., 1889.

Middle-piece of the head subtrapezoidal, depressed in front. Marginal fold distinct, elevated. Glabella ovate-conical, indented on the sides with two furrows, moderately arched backward. Occipital ring rounded behind, divided from the glabella by a distinct furrow, bearing a small tubercle on the middle. Cheeks arched upward in the middle; eyelobes prominent, ocular fillet faint. Movable cheeks prolonged behind, tumid along the middle, terminated by a strong genal spine directed backward and outward; the spine is about as long as the rest of the cheek; the cheek has a strong marginal fold on the outer side, and a short but distinct posterior fold.

The pygidium is nearly semicircular, longer than half of its width, and has a rather broad, flat margin. Rachis distinct, extending to the marginal furrow, divided by two distinct and two or more faint rings. Lateral lobes of the pygidium with three lobes on each side.

The hypostome found loose with this species is subrectangular, rounded in front, truncated at the posterior corners, depressed at the ends, and having there a narrow upturned fold.

Size.—Length of the middle-piece of the head, 6 mm.; width, 10 mm. Length of movable cheek, 11 mm.; width, 4 mm. Length of pygidium, 4 mm.; width, 7 mm. Length of hypostome, 3 mm.; width, 2 mm.

Horizon and Locality.—In calcareous layers of the fine, dark, olive-grey shales north of the flags of Division 2, at Long Island, Kennebecasis River.

Anomocare, sp.

Examples of a pygidium indicating a species twice as long as the above occur with it. Possibly the same species of a larger size.

Anomocare spiniger. Matt. (Pl. XIII, figs. 4 *a–e.*)

Leptoplastus spiniger. 'Can. Rec. Sci.,' Oct., 1889.

Middle-piece of the head subtrapezoidal, with a spinous projection in front. The head is strongly bent down in front, and has a distinct marginal fold; the fold is produced in front into a sharp, slender spine, more than half of the length of the glabella. Glabella

ovate-conical, with two pairs of short, slightly oblique furrows. Occipital furrow distinct, crossing the axis. Occipital ring broad in the middle, bearing a tubercle to which a spine is sometimes attached. Fixed cheeks tumid. Eyelobes prominent. Posterior fold and furrow distinct.

Movable cheek, rather narrow, attenuated backward into a spine of about its own length; the cheek has a strongly folded margin on the outside, but scarcely any behind. The cheek is vaulted on a line extending from the eyelobe to the spine.

The pleuræ are traversed by a strong furrow, extended toward the extremity.

The pygidium found with this species is a third wider than long, with a high narrow rachis and low side lobes, and a flattened border fold, furrowed within. The rachis is divided into 5 (or 6) joints, and the side lobes are marked by two furrows on each side of the rachis.

Size.—Length of centre piece of the head (excluding the spine), $2\frac{1}{2}$ mm.; width, 4 mm.; apical spine, $\frac{1}{2}$ mm. Movable cheek, length, $4\frac{1}{2}$ mm.; width, 1 mm. Pygidium, length, $1\frac{1}{4}$ mm.; width, 2 mm.

Horizon and Locality.—Found with the preceding.

Dr. W. Dames, in his studies of the Cambrian fauna of Liau-Tung, discovered a number of species which he referred to Anomocare, chiefly on the ground of the broad borders and the narrow, many jointed pygidia. In this connection he discusses Angelin's description of the genus, and speaks of the difficulty of recognizing species of the genus owing to the imperfect figures in Angelin's work,[1] and some errors in placing together the heads and tails of different species. Through Linnarsson's and Brögger's corrections of these errors, and by means of the well arranged material of the Royal Museum at Stockholm, he was enabled to reach a certainty in naming the Chinese forms. In his remarks on the various genera of the Chinese deposits he gave the range of this genus. Through the studies of Nathorst and Tullberg the layers of the Cambrian slates have become thoroughly known, and it has been found that the chief extent of territory of the genera Anomocare and Liostracus is in the Andrarum Limestone or the Zone of *Paradoxides Forchammexi.*

If we were to follow this ruling we would place the shales with Anomocare at the top of the Paradoxides beds. But our species are not typical, and so strict a limit should not be given. It is worthy of consideration, however, that the species of Agnostus which accompanies these two species of Anomocare ranges in Europe through the lower Olenus beds. We should, therefore, be inclined to place these Long Island trilobites at a lower horizon than we did when originally describing them, *i.e.*, in the Olenus beds proper.

Obolus pulcher. Matt.

[1] 'Can. Record Sci.,' Jan., 1889, p. 303.

[1] 'Trans. Roy. Soc. Can., Vol. vii, Pt. iv, p. 151. Pl. viii, figs. 1 *a* to *m* and 2 *a* to *l*.

Note on the above species.—On a comparison of this species with the Obolus described on a preceding page, it is clear that there are important differences of structure.

O. refulgens occurs at the geological horizon of *O. Apollinis* of Russia, the type of the genus; with this species it agrees in all respects as regards its generic characters, except

[1] 'Palæontalogica Scandinavica.'

in the thin dorsal hinge line.[1] The three diverging ridges which are found in the ventral valve of the two last species are not present in *O. pulcher;* in this there are radiating lines, but these appear to be vascular lines, and do not have the same position as the ridges in the two first species.

The internal markings of the dorsal valve in the last species are similar to those of *O. refulgens*, but as de Verneuil does not figure the interior of the dorsal valve of *O. Apollinis*, means of comparison with the dorsal valve of this species are wanting.

An important difference between *O. pulcher* and the two other species is in the hinge, and especially in the different form of the umbo. The prominent umbo of this species has been fully described in the author's paper on 'Cambrian organisms,'[2] and is of the greater value as a distinctive feature, since it is most noticeable in the earlier stages of growth. In *O. refulgens* the beak in both valves is always low and appressed to the marginal line (though that of the ventral valve is somewhat more prominent than the other), and an appressed beak seems also to have characterized *O. Apollinis.*

The differences in these respects and others between *O. pulcher* and the later Oboli are, we think, of subgeneric value, and we would propose for *O. pulcher* the subgeneric name *Botsfordia*, in honour of the late president of the Natural History Society of New Brunswick.

Late studies by Dr. Charles Barrois, of Lille, France, on the Palæozoic rocks of the Asturias and Galicia in the north-west of Spain,[3] shows how strong a local facies in a fauna may cöexist with a general succession of species in consonance with that of other countries.

Dr. Barrois chronicles from the provinces above named a Cambrian fauna consisting of eight species, of which one is a cystidian, one a brachiopod, and the remainder are trilobites. A peculiarity of this fauna is that while it contains some of the species which Barrande described from the neighbouring province of Leon, several species are peculiar to it, and predominate in numbers over the species which Barrande had found in Leon.

The genera are all characteristic of the Lower Cambrian fauna, and the Paradoxides are of an ancient type, related, as Dr. Barrois tells us, to *P. rugulosus* and *P. spinosus.* He describes a new species of Paradoxides of this type related to *P. rugulosus*, and figures a hypostome belonging to it; the hypostome resembles those of this group in having no doubleur attached, but differs in having no posterior spine.

In conclusion, the writer desires to express his thanks to Dr. G. Lindström, of the Royal Museum at Stockholm, for authentic specimens of *Orthis lenticularis*, and to Prof. W. F. Ganong, of Harvard College, for procuring original descriptions of this species.

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[1] The difference in this respect the author supposes may be due to a difference of habitat.

[2] 'Trans. Roy. Soc. Can.,' Vol. vii, Pt. iv, p. 152.

[3] "Recherches sur les terrains anciens des Asturias et de la Galice," par Ch. Barrois, D.S., Lille, 1882.

Explanation of the Plates.

Plate XII.

Fig. 1.—*Dictyonema flabelliforme.* Eichw. Whole hydrosoma. Mag. $\frac{2}{1}$. From Div. 3*c*, Navy Island, St. John Harbour. **See p. 34.**

Fig. 2.—*Dictyonema flabelliforme.* Reduced $\frac{1}{5}$. To show the shape of vasiform and funnel-formed hydrosomes.

Fig. 3.—*Dictyonema flabelliforme.* Natural size.—3*a*, hydrosome in the dichograptoid stage—3*b*, hydrosome in the second stage, when the cross-threads begin to appear. From Div. 3*c*, Navy Island. **See p. 38.**

Fig. 4.—*Lingulella lævis*, n. sp. Nat. size.—4*a*, interior of ventral valve—4*b*, exterior of dorsal valve. From Div. 3*a*, Carleton shore, St. John Harbour. **See p. 39.**

Fig. 5.—*Lingulella Starri.* Matt., var. *minor.* Mag. $1\frac{1}{2}$.—5*a*, ventral valve—5*b*, dorsal valve. From Div. 2, Long Island, Kennebecasis River. **See p. 58.**

Fig. 6.—*Obolus refulgens*, n. sp. Mag. $\frac{2}{1}$.—6*a*, ventral valve—6*b*, dorsal valve—6*c*, interior of ventral valve, showing the three diverging ridges, and showing: *a′*, pedicel groove; *b′*, scars of posterior adductors; *c′*, outline of visceral cavity; *d′*, scar of central adjustor (?).—6*d*, interior of dorsal valve, showing low median ridge and faint lateral ridges; also *b′*, scar of adductor muscle. **See p. 44.**

Fig. 7.—*Linnarssonia* (?) c. f. *Belti.* Dav. Mag. $\frac{3}{1}$.—7*a*, ventral valve—7*b*, dorsal valve—7*c*, interior of ventral valve. From Div. 3*c*², Navy Island. **See p. 42.**

Fig. 7*d*.—*Acrotreta Baileyi.* Matt.? Mag. $\frac{3}{1}$.—Mould of interior of dorsal valve. From Div. 3*c*², Navy Island. **See p. 43.**

Fig. 8.—*Obolella* (?) *gemmula*, n. sp. Mag. $\frac{3}{1}$.—8*a*, ventral valve—8*b*, interior of ventral valve, showing central looped ridge and sinuate lateral ridges—6*c*, interior of dorsal, showing short ridge at the umbo. From Div. 3*c*², Navy Island. **See p. 41.**

Fig. 9.—*Orthis lenticularis.* Wahl. Mag. $\frac{2}{1}$.—9*a*, usual form and size of ventral—9*b*, large form dorsal valve—9*c*, mould of ventral, showing. *a′*, adductor; *b′*, cardinal scars; *o′*, ovarian spaces—9*d*, mould of dorsal, showing: *b′*, double scars of adductors; *o′*, ovarian spaces. **See p. 46.**

Fig. 10.—*Orthis lenticularis*, var. *lyncioides*, n. var. Mag. $\frac{2}{1}$, except 10*a*, which is $\frac{3}{1}$.—10*a*, young shell, ventral, with sharp, distant ridges—10*b*, full-grown ventral, which became smooth in its later growth—10*c*, same variety, dorsal valve. From Div. 3*a*, Germaine street. **See p. 49.**

Fig. 11.—*Orthis lenticularis*, var. *atrypoides*, n. var. Mag. $\frac{2}{1}$.—11*a*, ventral valve—11*b*, dorsal valve. From Div. 3*a*, Germain-street. **See p. 48.**

Fig. 12.—*Orthis lenticularis*, var. *strophomenoides*, n. var. Mag. $\frac{2}{1}$.—12*a*, ventral valve—12*b*, dorsal valve. From Div. 3*a*, Germaine street. **See p. 49.**

Fig. 13.—*Orthisina ? Johannensis*, n. sp. Mag. $\frac{2}{1}$.—13*a*, ventral valve—13*b*, profile showing hinge area of same—13*c*, dorsal valve. From Div. 3*a*, Germaine street. **See p. 49.**

Plate XIII.

Fig. 1.—*Agnostus pisiformis.* L. var. Mag. $\frac{4}{1}$.—1*a*, head-shield—1*b*, pygidium. From Div. 2, Long Island. **See p. 59.**

Fig. 2.—*Agnostus bisectus*, n. sp. Mag. $\frac{4}{1}$.—2*a*, head-shield—2*b*, pygidium. From Div. 3*b*, Navy Island. **See p. 50.**

Fig. 3.—*Anomocare stenotoides.* Matt. Mag. $\frac{2}{1}$.—3*a*, head-shield—3*b*, movable cheek—3*c*, pygidium—3*d*, supposed hypostome. From Div. 2, Long Island. **See p. 61.**

Fig. 4.—*Anomocare spiniger.* Matt. Mag. $\frac{4}{1}$.—4*a*, head-shield—4*b*, same in profile—4*c*, movable cheek—4*d*, a pleura—4*e*, pygidium. From Div. 2, Long Island. **See p. 61.**

Fig. 5.—*Parabolina spinulosa.* Wahl.—5*a*, head-shield—5*b*, movable cheek; both natural size—5*c*, pygidium, mag. $\frac{2}{1}$—5*d*, young pygidium, mag. $\frac{3}{1}$ All from from Div. 3*a*, Germaine street. **See p. 51.**

Fig. 6.—*Parabolina heres*, Brög., var. *lata*, n. var.—6*a* head-shield, full size—6*b*, head-shield - 6*c*, movable cheek—6*d*, hypostome—6*e*, pygidium; all mag. $\frac{2}{1}$—6*f*, young individual, mag. $\frac{3}{1}$. All from Div. 3*b*, Navy Island. **See p. 51.**

Fig. 7.—*Parabolina heres*, var. *grandis*, n. var. Pygidium, nat. size. From Div. 3*b*, Navy Island. **See p. 52.**

Fig. 8.—*Protopeltura acanthura*, Ang., var. *tetracanthura*, n. var.—8*a*, head-shiled, mag. $\frac{2}{1}$. From Div. 3*a*, Germaine street.—8*b*, movable cheek—8*c*, pygidium. Both mag. $\frac{2}{1}$ and from Navy Island. **See p. 53.**

Fig. 9.—*Peltura scarabeoides*. Wahl. Nat. size.—9*a*, part of head-shield—9*b*, two pleura of different lengths. From Div. 3*b*, Navy Island. **See p. 53.**

Fig. 10.—*Leptoplastus latus*, n. sp. Mag. $\frac{2}{1}$.—10*a*, head-shield—10*b*, movable cheek—10*c*, part of thorax and the pygidium. From Div. 3*b*, Navy Island. **See p. 54.**

Fig. 11.—*Leptoplastus latus*, var. Mag. $\frac{2}{1}$. Head-shield and seven joints of the thorax. From Div. 3*b*, Navy Island. **See p. 55.**

Fig. 12.—*Ctenopyge flagillifer*. Ang., var. Mag. $\frac{4}{1}$.—12*a*, head-shield—12*b*, movable cheek. From Div. 3*b*, King-street, St. John. **See p. 56.**

Fig. 13.—*Ctenopyge spectabilis*. Brög. var. Mag. $\frac{4}{1}$.—13*a*, head-shield—13*b*, movable cheek. From Div. 3*b*, King-street, St. John. **See p. 57.**

Fig. 14.—*Conocephalites contiguus*, n. sp. Mag. $\frac{2}{1}$.—14*a*, part of head-shield. From Div. 3*a*, Germaine street.—14*b*, part of head-shield. From Div. 3*b*, Navy Island. **See p. 58.**

VI.—*On the Geology of the St. Clair Tunnel.*

By FRANK D. ADAMS, Lecturer in Geology, McGill University.

(Communicated by Sir William Dawson and read, May 27, 1891.)

The St. Clair Tunnel, one of the most useful and important engineering works of recent years, runs under the St. Clair River from Sarnia, Ontario, to Port Huron, Michigan, and joins the Chicago & Grand Trunk Railway in Michigan with the Great Western Branch of the Grand Trunk Railway in Canada. These points had formerly been connected by a steam car ferry, but owing to the great annual expense and the uncertainty of this means of communication, especially in winter, when the ice from Lake Huron is passing down the St. Clair, as well as to the steady increase of traffic over the line, it was decided to tunnel the river at this point, so that a continuous track might be laid.

The tunnel proper was commenced in August, 1889, and finished in August, 1890, the work being thus completed within about one year, the time being the fastest yet made in tunnel construction.

The work was begun by opening horizontal cuttings to the required depth on either side of the river, and on each of the headings thus formed a tunnel was commenced by means of Beach hydraulic shields, the tunnels finally meeting under the river and thus completing the work.

The tunnel is 6,000 feet long and 21 feet in diameter, the walls being constructed of cast iron segments bolted together.

As the tunnel passes through the heavy deposits of drift which cover this portion of the boundary of Canada and the United States, it seemed probable that an examination of the material excavated might prove of interest. Sir Joseph Hickson kindly consented, on request of Sir William Dawson, to secure specimens of the material passed through as the work proceeded, and this was arranged for through the kindness of Mr. James Hobson, the chief engineer of the tunnel; eight samples, taken from different points between the Canadian and American ends of the tunnel, being forwarded to the Peter Redpath Museum of this University and placed in the hands of the writer for examination.

GENERAL GEOLOGY OF THE DISTRICT.

Resting on the Laurentian axis, whose southern edge forms the eastern shore of the Georgian Bay, 180 miles northeast of Sarnia, there is, as is well known, a regular succession of Palæozoic strata, having a general southwesterly dip and forming an almost continuous series from the horizon of the Black River beds to that of the Chemung. These underlie what is known as the peninsula portion of the province of Ontario. Passing over the St. Clair River, into the state of Michigan, we find these highest beds succeeded

by the sandstones, etc., of the "Waverly Group," which marks the base of the Carboniferous, and which in its turn is overlaid by the carboniferous limestone and coal measures occupying the central portion of the state.

The distribution of these formations is shown in the accompanying geological map. The entire area, however, both in Ontario and Michigan is heavily drifted, so that over long stretches of country no outcrop can be seen.

This drift in Ontario has not been as yet carefully studied. In the early years of the Canadian Geological survey it was examined in a general way, and in the 'Geology of Canada,' published in 1863, was classified as follows, in descending order :—

Recent Alluvia.
Artemesia Gravel and Algoma Sand.
Saugeen Clay and Sand.
Erie Clay.
Boulder Clay.

There is reason to believe, however, that the Saugeen clay and, perhaps, some of the other members of the series are secondary deposits whose material was derived from the underlying boulder clay.

The following extract from a report prepared by Dr. Bell, of the Canadian Geological survey, for the Royal Commission on the Mineral Resources of Ontario, gives a general description of the Saugeen and Erie clays :—

"West of the points above mentioned, south of the height of the land, the marine deposits are replaced by others which appear to be in part, at least, of fresh water origin. One of the most important of these is an extensive blue clay deposit which we have called the Erie clay, and which has as yet yielded no organic remains of any kind. It burns to white bricks, while the marine clays to the east burn red. The Erie clay is often very calcareous, and is seldom or never entirely free from pebbles and stones, more or less thickly disseminated through it. Indeed, it often seems to merge into the underlying boulder clay. It covers the whole of the southwestern part of the western peninsula, and is locally developed in many other parts of the province, as far east as the line of railway from Brockville to Ottawa. Its greatest known depth is about 200 feet, but it is found at differences of levels amounting to 500 feet. When seen in fresh sections it presents lines of stratification, and often a transversely jointed structure. In some localities its upper parts have been unevenly denuded before the deposition of the next higher formation, which consists of brownish clay yielding red bricks. This unconformable formation is well developed in the valley of the Saugeen River, and hence it has received the name of the Saugeen clay. Its thickness appears to be less than that of the Erie clay, but it is found in broken areas in all parts of the province, except the most easterly and northerly. When seen in fresh sections it is usually found to be very distinctly stratified in thin layers; sometimes with partings of fine sand between them. Beds of sand and gravel are occasionally found between the Erie and Saugeen clays, and these are of importance as affording good wells of water. Fresh water shells have been detected in a few instances in the Saugeen clay."

The "marine clays" above mentioned are those found in the valley of the St. Lawrence east of Brockville and known as the Leda clays, being probably the eastern equiva-

lent of the Erie and Saugeen clays laid down under different conditions. This Leda clay will be referred to again later on.

Character of the Strata penetrated by the Tunnel.

Judging from the character of the deposit there is reason to believe that the St. Clair tunnel passes through boulder clay, though being in places very sandy, and having in some places a certain stratification, it partakes of the character of the Erie clay, which, as above mentioned, graduates into the boulder clay, and may really prove to be a peculiar development of it. The material obtained from the tunnel is a stiff clay, in places, as above mentioned, very sandy, and elsewhere very gravelly, while occasionally large gneiss boulders are found embedded in it.

When dry it is grey in colour, but assumes a pale reddish yellow tint on burning. Judging from the samples received it is entirely destitute of fossils.

This clay rests on a dark bituminous shale, with abundance of *Protosalvinia Huronensis*, characteristic of the so-called "Huron shale" of Chemung age, which is well exposed in Ontario at Kettle Point on Lake Huron, and is extensively developed on the Michigan peninsula. This Huron shale was struck at the bottom of a shaft which was sunk for drainage purposes close to the Canadian end of the tunnel and, as seen in the accompanying section, also occurs only a few feet below that portion of the tunnel which is beneath the river bed.

Two specimens of the rock from the bottom of this shaft were forwarded by Mr. Hobson. One consists of a thinly laminated brownish black bituminous shale holding, as above mentioned, an abundance of *Protosalvinia Huronensis*.[1] When a fragment of the shale is held in the flame of a Bunsen burner it decrepitates slightly and takes fire, being sufficiently bituminous to continue burning for some time after having been removed from the flame. The other specimen is harder and less thinly laminated as well as less bituminous than the one just described. It also contains Protosalvinia. It is, however, highly calcareous, effervescing readily when treated with dilute hydrochloric acid, while the first mentioned specimen does not effervesce at all. The Chemung beds exposed at the bottom of the shaft, therefore, consist of highly bituminous shales interstratified with coarser, less bituminous and highly calcareous strata.

As above mentioned, although some of the samples of drift received consisted of a comparatively pure clay, they generally contained a great deal of gravel or sand.

The following notes kindly sent me by Mr. Joseph Hobson, chief engineer of the tunnel, will explain their mode of occurrence:—

"Immediately over the rock there are a number of strata of quicksand and rough gravel. The thickness of these strata varies from two to three feet up to six feet.

"With regard to the sand found in the clay during the progress of the work it was usually in the shape of pockets, although occasionally the beds of clay were separated by films of sand not much thicker than a piece of coarse paper; in fact these seams were so

[1] Sir William Dawson, "On Rhizocarps in the Erian (Devonian) Period in America" (Bull. Chicago Acad. of Science, Vol. i, 1886); also "On Sporocarps discovered by Prof. E. Orton in the Erian Shale of Columbus, Ohio" (Canadian Record of Science, 1888, p. 137).

thin, and the clay and the sand being of the same colour, it was not possible to distinguish them until the upper bed of clay slid off the lower.

"Boulders were occasionally struck, some of them containing two or three cubic yards.

"The large boulders were not numerous; perhaps there were not more than half a dozen of them. I am now speaking of boulders too large to pass through the compartments of the shields; of small boulders there were a considerable number. They were all, so far as I know, coarse granite. The workmen used to call them 'bastard granite.'

"The bed of the river consists of sand and gravel, varying in thickness from a few inches to several feet."

In order to ascertain the proportion of sand and gravel present, weighed portions of the several samples were submitted to a process of washing or elutriation, being repeatedly stirred with successive portions of water and allowed each time to settle for ten seconds; in this way only the clay and the exceedingly fine sand were removed. The gravel and the rest of the sand remaining behind were then weighed. The amount of carbonic dioxide present in the several samples was also kindly determined by Mr. A. Klock, under Dr. Harrington's supervision, in the chemical laboratory of this University. These results, together with the amount of carbonate of lime represented by the carbonic acid in each case, are given in the following table:—

Number of Specimen.	Point from which Specimen was Taken.	Percentage of Sand and Gravel.	Percentage of Carbonic Dioxide.	Percentage of Calcium Carbonate.
I.	Canadian side, 1,500 feet east of river and 70 feet below surface	11·0	6·238	14·180
II.	American side, 1,000 feet west of river and 60 feet below the surface.	12·2	6·706	15·241
III.	Various points	3·2	6·987	15·880
IV.		40·8 (Sand & Gravel)	5·225	11·875
V.		54·0 (Sand & Gravel)	5 872	13·347
VI.		64·4 (Sandy)	4·440	10·100
VII.	Canadian side, 1,643 feet in and 80 feet below the surface	81·4 (Gravelly)	5·981	13·60
VIII.	Canadian end of tunnel	73·8 (Sandy)	3·387	8·800

It may here be mentioned, however, that a certain amount of magnesia is probably present in combination with lime and carbonic acid, forming a dolomitic limestone rather than a pure carbonate of lime.

Nos. 1 and 2 when boiled with concentrated hydrochloric acid for an hour left 68·3 per cent. and 68·8 per cent. of insoluble residue respectively.

The following figures showing the amount of calcium carbonate in brick clays from

other parts of Ontario may be of interest for comparison. The determinations were made by Dr. B. J. Harrington and have not hitherto been published :—

LOCALITY	Per cent. of Calcium Carbonate.
Yorkville, Ont.....	2·77
" "	26·72
Pembroke, "	·068
Glenwilliam, "	26·72
Arnprior, "	11·36
Peterboro', "	53·05

Petrographical Character of the Gravel.

The gravel in these clays is generally small, passing into sand, but in No. VII. some of it was quite coarse, the largest fragments measuring as much as two inches across. It is composed principally of worn fragments of soft brownish-black earthy looking bituminous shale. When struck with a hammer this readily splits up into thin fragments parallel to the lamination, and when held in the flame of a Bunsen burner decrepitates and takes fire, burning for a second or two and giving off a strong tarry odour.

In almost every case where a broken fragment of the shale is examined by means of a lens it is seen to be thickly strewed with the minute sporocarps of *Protosalvinia Huronensis*, characteristic of the Chemung (Huron) shales, from exposures of which the fragments were evidently derived.

In addition to the fragments of Huron shale, a number of fragments, more or less worn, of a soft fine grained, somewhat dolomitic, and micaceous sandstone, are found in the gravel, as well as some much smaller fragments of brownish or yellowish limestone, often highly magnesian. These latter are sometimes pure, and at other times contain a very large amount of siliceous and argillaceous insoluble residue. Occasionally a few rounded fragments of white or greenish quartzite are also found.

A number of fragments of the sandstone referred to above were crushed and treated with warm dilute hydrochloric acid. A slight effervescence took place, and small amounts of iron, lime and magnesia passed into solution. The dolomite being thus removed, the insoluble residue was mounted and examined with the microscope. A thin section of one fragment was also prepared. The sandstone was found to consist of the following minerals:—quartz, orthoclase, microcline, plagioclase, muscovite, biotite, hornblende (?), tourmaline, zircon, sphene (?) together with some opaque dark grains, possibly of some carbonaceous material. In the thin section, which was not treated with dilute hydrochloric acid before examination, dolomite and ferric hydrate could also be recognized. The little crystals and grains of tourmaline and sphene (?) closely resembled those which, as mentioned below, were found in the sand occurring with the clay.

One large well laminated fragment of this sandstone had a structure resembling false bedding and showed what Sir William Dawson believes to be obscure worm burrows or fucoid markings.

In all its characteristics it closely resembles the sandstones of the "Waverly Group," which, in Michigan, overlie the Huron shales. (See report of the Geological survey of Michigan, 1873-76, Vol. III, pp. 69-101.)

The limestone fragments were small and contained no fossils visible to the naked eye, or with the help of a lens. Some of the minute grains mixed in with the sand, however, when properly mounted and examined under the microscope, were found to possess an organic structure; some of them resembling fragments of crinoids, while others had a minutely punctate character and were probably fragments of brachiopod shells. There is nothing, therefore, to indicate the age of the beds from which these limestone fragments have been derived. They may have come from the thin beds of limestone interstratified with the sandstones of the "Waverly Group," or they may be from older strata of Corniferous, or even Niagara age. The very few fragments of quartzite have no distinctive characters by which their origin can be determined; some of them resemble the quartzite of the more compact beds of the Oriskany formation.

Petrographical Character of the Sand.

As will be seen by referring to the table, Nos. VI. and VIII. consist very largely of sand: No. VIII, in fact, is a nearly pure sand, but a portion of it being extremely fine was washed away during the process of elutriation. Another portion of No. VIII was carefully elutriated, and the material of various degrees of coarseness being thus separated, specimens of each were mounted in Canada balsam for microscopic examination, while others were prepared in almond oil and in water. The constituents found in this sand are the same as those found in the sands separated from the other samples, although all the minerals here mentioned were not found in every case. A brief description of this sand, therefore, will serve to indicate the character of the whole.

The coarse portions separated by the washing were found to be composed of the following minerals:—quartz, orthoclase, microcline, plagioclase, hornblende, epidote, tourmaline, garnet, calcite, pyrite, magnetite, sphene (?).

A few small pieces of the shale and sandstone before mentioned were also present.

The quartz occurs principally in partially rounded fragments, but also as angular chips, while a number of grains are perfectly rounded with a surface like ground glass. They are generally clear and colourless, but some few have the surface stained red by oxide of iron. Some of them hold the minute black hair-like bodies often seen in the quartz of the crystalline schists. Some of the quartz grains in the sand in No. I. show the peculiar crushed or broken character so often seen in the quartz of gneiss.

The orthoclase is not nearly so abundant as the quartz and occurs usually in much decomposed grains. It shows a biaxial figure in convergent light.

Microcline and plagioclase in well characterized grains occur in every slide. Hornblende occurs in green transparent anisotropic grains, often strongly pleochroic in tints of green. Generally in oblong grains with slightly inclined extinction and absorption $\mathfrak{c} > \mathfrak{a}$ Tourmaline was found in the sands of all degrees of fineness. It occurs in short, stout prisms, terminated at one extremity by a flat pyramid; the other end is sometimes similarly terminated, but is generally irregular. One of the largest of these little prisms was

found to measure ·05 × ·027 mm. They have a high index of refraction and strong double refraction, with parallel extinction, and show strong pleochroism in tints ranging from light brown, yellowish or greenish brown to deep brown or nearly black. The greatest absorption is in a direction at right angles to the length of the crystal. It is uniaxial and negative and shows no cleavage. These characters leave but little doubt that the mineral is really tourmaline.

The garnet is pink in color and isotropic with high index of refraction.

The calcite is present in considerable amount, the sand effervescing readily when treated with dilute hydrochloric acid, and occurs principally as cleavage fragments. It is uniaxial and negative, and between crossed Nicols shows the characteristic white of the higher orders. Although here referred to as calcite, as some of the grains at least are attracted by the electro-magnet showing that they contain some iron, it may really be dolomite in part.

Pyrite occurs in numerous little yellow grains with crystalline faces. Some of these are very minute but perfect octahedra. In No. IV, in addition to little rounded grains resembling minute concretions, a number of little octahedra were found often in groups. One very perfect little octahedron, showing also planes of the pentagonal dodecahedron, measured ·07 mm. in diameter. On account of the good form and sharp angles usually possessed by this pyrite it seems probable that it has crystallized in the drift.

The mineral referred to as sphene (?) occurs in small rounded grains with high index of refraction and high double refraction, and is either sphene or zircon, but I was unable to find any grain in which an axial figure could be obtained.

The fine material deposited from the first washing was found to be made up altogether of minute grains of different minerals. In addition to those already mentioned biotite and a colourless mica resembling muscovite, but probably belonging to some hydrated species, were also present. A very small amount of a fine grained aggregate, probably kaolin, was also seen in the slides.

Petrographical Character of the Clay.

A careful microscopical examination of the clay separated by washing from Nos. I. and VI. was also made. These clays were found to be almost identical in character, and may be taken as representing the clays of the whole deposit.

The material is exceedingly fine and requires a very high power for its examination. Minute fragments of calcite, orthoclase and little mica shreds can always be recognized, as well as in some cases little grains of plagioclase, hornblende and quartz. Kaolin is also present, and in No. I. occurs in large amount. Mixed with these minerals in No. I. and in No. IV., constituting a very large proportion of the clay, are dark fragments, which are opaque, except on the thinnest edges, where they are seen to be composed of a kaolin-like aggregate holding opaque grains. This is in part at least the Huron shale in a finely comminuted condition, while a portion of it seems to be a decomposition product of orthoclase.

Origin of the Drift penetrated by the Tunnel.

It is evident from the character of the drift as above described, that with the exception of the comparatively few boulders of Laurentian gneiss embedded in it, it has not been brought from the far north, but has been derived very largely, if not exclusively, from the wear and tear of the Huron shales and rocks of the "Waverly Group" which occur in the immediate vicinity. This is indicated by the character of the gravel which is present in almost every sample of the clay, sometimes constituting a large proportion of the whole.

Although the peculiar character of the sand shows that it has been derived originally from the gneisses of the Laurentian, it seems pretty certain that its proximate origin is to be found in the "Waverly" sandstones, since not only are fragments of sandstone, which, as shown above, there is every reason to believe belong to this group, scattered through the drift and occur even in these very beds of sand, but the sandstone itself contains nearly all the minerals found in the sand, and among them some of the rarer and more characteristic species. The character of the clays also points to a similar origin. Since the general movement of the drift in this district was from north to south, the material constituting the drift penetrated by the tunnel must have come from some portion of the area now occupied by Lake Huron.

This conclusion, as will be seen by consulting the accompanying geological map, is in perfect accord with that indicated by the composition of the drift itself, namely, that it is derived from the wear and tear of the Huron shales and beds of the "Waverly Group," seeing that a considerable portion of the southern half of Lake Huron lies in a depression scooped out of these formations. A great part of Lake Michigan also must be underlain by rocks of this age.

The Leda Clay.

As above mentioned, the Erie and Saugeen clays do not extend down the valley of the St. Lawrence below Brockville. East of this point their place is taken by a deposit of clay quite different in character and known as the Leda clay. This clay is in places highly fossiliferous, and, as indicated by its fossils, is of truly marine origin.

For comparison with the clays above described a typical specimen of this Leda clay was examined microscopically. The sample, which was given to me by Sir William Dawson, was taken from an excavation on Sherbrooke street, in the city of Montreal. It is an impalpably fine clay with no admixture of sand and gravel. When powdered and carefully washed a minute residue remains, which, when examined under the microscope, is seen to consist of little angular fragments quite clear and fresh of the following minerals:—quartz, microcline, orthoclase, plagioclase, hornblende, garnet, calcite, apatite (?), tourmaline (?). The quartz sometimes shows the uneven extinction so often seen in gneiss. Under the microscope the rest of the clay is seen to consist of exceedingly finely divided kaolin, with here and there a few minute brilliantly polarizing fragments of one or other of the above mentioned mineral species.

This difference in the character of the Leda clay and the clays from the St. Clair

tunnel is in all probability due to the fact that the Leda clay was deposited far from land in what was then a great westward extension of the Atlantic.

In closing I desire to thank the various gentlemen to whom I am indebted for assistance in carrying out this investigation. My thanks are due more especially to Sir Joseph Hickson and Mr. Joseph Hobson for having the samples carefully collected and forwarded, as well as for notes on their mode of occurrence, and to Sir William Dawson, at whose request I undertook the examination of the same, for aid more particularly in the determination of the fossils.

VII.—*The Orthoceratidæ of the Trenton limestone of the Winnipeg basin.*

By J. F. WHITEAVES.

The present paper consists of a critical and systematic list of the *Orthoceratidæ* at present in the Museum of the Geological Survey of Canada from the formation and region indicated in its title, with descriptions of such species as appear to be new. The whole of the species belonging to the genera included by Dr. Karl Zittel in this family are considered in it, as nearly as possible in the same order as that adopted in the second volume of the "Handbuch der Palæontologie," but the genera *Actinoceras* and *Sactoceras* are here regarded as distinct from *Orthoceras*, and *Poterioceras* from *Gomphoceras*.

The term "Trenton limestone" is used in a somewhat comprehensive sense, to include all those highly fossiliferous deposits which immediately and conformably overlie the St. Peter's sandstone and underlie the Hudson River formation.

With the exception of two or three examples of a variety of *Endoceras annulatum* from the Nelson River in Keewatin, the whole of the specimens referred to are from Manitoba, either from the valley of the Red River (at Lower Fort Garry or East Selkirk), the western shore of Lake Winnipeg, or from some of the numerous islands in that lake. Lower Fort Garry, or Stone Fort as it is sometimes called, is on the west bank of the Red River, seventeen miles N. N. E. of the city of Winnipeg. The quarry at East Selkirk, from which the fossils from that locality were obtained, is on the east side of the Red River and five miles E. by N. of Lower Fort Garry.

A few unusually fine specimens from East Selkirk were presented to the Museum of the Survey by Mr. A. McCharles in 1884, but most of the remainder were collected by members of the staff during the last ten or eleven years. The exact localities, with the names of the collectors and the date at which the specimens were collected, will be stated under the heading of each species.

ENDOCERAS ANNULATUM, Hall. VAR.

Plate V, figs. 1 and 1a.

Endoceras annulatum, Hall. 1847. Pal. St. N. York, vol. I, p. 207, pl. xliv, figs. 1, a, b.

Between the second and third rapids of the Nelson River, Keewatin, Dr. R. Bell, 1879: a cast of the interior of the septate portion of the shell and two fragments. The most perfect of these specimens, the one figured, differs from the type and only known specimen of *E. annulatum*, as described and figured by Hall (which is also a septate cast) in the much more oblique disposition of its annular ridges, each of which passes obliquely over three of the septa. In transverse sections, the outlines of both shell and siphuncle

of the Nelson River specimens are broadly elliptical, but this appearance is probably due to the abnormal compression to which they have been subjected.

Endoceras subannulatum, Whitfield.

Plate V, figs. 2 and 2a.

Endoceras (*Cameroceras*) *subannulatum*, Whitfield. 1882. Geol. Wiscons., vol. iv, p. 230, pl. vii, figs. 15 and 16.

Numerous examples of a large annulated *Endoceras*, which in many respects agree fairly well with Professor Whitfield's description of this species, have been collected in the valley of the Red River, on the western shore of Lake Winnipeg and on many small islands in that lake. Specimens in which the annulations of the exterior are preserved were obtained at East Selkirk by Dr Bell in 1880, by Messrs. T. C. Weston and A. McCharles in 1884 and by Mr. L. M. Lambe in 1890; at Grindstone Point, Lake Winnipeg, by Mr. Weston in 1884, and by Mr. J. B. Tyrrell in 1889; near Cat Head, by Mr. Donald Gunn in 1853; at Swampy or Beren's Island, by Mr. Tyrrell in 1889, and by Messrs. Dowling and Lambe in 1890; at Snake Island, Jack Head Island (near Pike Head), Black Island (near Beren's Island), and at Big Sturgeon Island, by Messrs. Dowling and Lambe in 1890. Very large but badly preserved specimens, which probably belong to the same species but which do not shew the characteristic surface ornamentation, were collected at Lower Fort Garry and at Dog's Head, Lake Winnipeg, by Mr. Weston in 1884; at Big Island, by Mr. Tyrrell in 1889; at Black Bear Island (near Snake Island), by Messrs. Dowling and Lambe in 1890; and at Commissioners' (or Cranberry) Island by Mr. Dowling in 1890.

The largest specimen in which any considerable portion of the test is preserved is the one from East Selkirk collected by Mr. McCharles, the posterior moiety of which is represented by figure 2, on Plate V. It is upwards of seventeen inches and a half in length, three inches and a half in thickness at the smaller end and about four and a quarter at the larger. It is septate throughout and its transverse annulations are comparatively narrow, there being five to an inch. The largest specimens without the test are upwards of two feet in length, and imperfect at both ends, while a large fragment, which, however, has been abnormally compressed, is eight inches in breadth by about fifteen in length. All of these also are septate throughout, and, so far, not a trace of the chamber of habitation can be found in any of the specimens from Manitoba. This is the more remarkable when it is borne in mind that the Wisconsin specimen of *E. subannulatum* figured by Professor Whitfield, which is represented as only two inches in breadth at the larger end, has no less than three inches and three quarters of the body chamber preserved and only about an inch and three quarters of the septate portion of the shell.

In *Endoceras annulatum* the septa are stated to be "more approximated than the annulations," but in the present species the opposite is the case, the sutures of the septa being usually about twice as far apart as the breadth of the annulations. In the Manitoba specimens, which may possibly prove to be distinct from the typical *E. subannulatum*, there is a considerable amount of variation in the proportionate thickness of the annula-

tions. Some medium sized ones, a little less or a little more than two inches in thickness, have as few as three or four annulations to the inch and others as many as six. The annulations, although always rounded at the summit, are by no means always "low," as described by Professor Whitfield, but are often so prominent as to give a strongly ribbed appearance to the shell, and the concave spaces between them are not infrequently broader than the annulations themselves.

Detached siphuncles of this species are by no means rare in Manitoba, the largest known to the writer (from Big Sturgeon Island) being fifteen inches and a half in length, nearly one inch and a quarter thick at its smaller end, and two inches and an eighth at its larger. The very large and apparently single siphuncular sheath is elongated, conical and rather thin walled, the test of the wall being about half a millimetre thick. The endosiphon has not been observed.

Endoceras crassisiphonatum. (Sp. Nov.)

Plates VI, figs. 1–4, and VII, fig. 1.

Siphuncle (the only part of the shell known) very long and thick, attaining apparently to a length of considerably more than four feet, circular in transverse section, nearly cylindrical, but alternately slightly swollen and as slightly constricted at distant but regular intervals, the constrictions, which cross the siphuncle somewhat obliquely, being probably caused by the overlapping of the posterior portion of the necks of the septa; increase in thickness very slow but regular, at the rate, so far as known, of three-tenths of an inch per foot; septa unknown, though the distances apart of the annular siphuncular constrictions and their obliquity seem to indicate that the septa also were widely distant, and the siphuncle itself either marginal or submarginal. Endosiphon narrow and nearly cylindrical posteriorly, but widening irregularly and gradually anteriorly. At the anterior end of the thickest specimen collected (which is represented in outline on Plates VI, fig. 4, and VII, fig. 1) the diameter of the endosiphon is a little more than half that of the siphuncle. In another specimen (the original of figure 3 on Plate VI) the interior of the narrow posterior end of the siphuncle appears to be portioned off by a few transverse concave dissepiments.

Collected at Lower Fort Garry by Mr. Donald Gunn in 1858; and at East Selkirk by Dr. R. Bell in 1880, by Messrs. McCharles and Weston in 1884 and by Mr. Lambe in 1890.

The most perfect specimen in the Survey collection, which it will be convenient to designate as No. 1, and which is represented in outline, one-fourth of the natural size, on Plate VI, fig. 1, was collected at East Selkirk by Mr. McCharles. Its actual length is three feet all but an inch, and it is obviously imperfect at both ends. It is the only specimen known to the writer in which the increase in thickness is very obvious. At the smaller end its maximum thickness is an inch and a tenth, and at the larger end just two inches. Its rate of increase, therefore, as already remarked, is three-tenths of an inch per foot.

Another large fragment, collected by Mr. Lambe at East Selkirk, which is represented in outline, of natural size, on Plate VII, fig. 1, and which may be indicated as specimen

No. 2, is about eight inches in length, by two inches and three and a half-tenths in its maximum thickness at one end and not appreciably more at the other. Judging by its thickness, No. 2 could very well have formed part of the anterior end of No. 1, and both are from the same locality. At the rate of taper of three-tenths of an inch per foot, it is estimated that specimen No. 1 would have to be eight inches longer anteriorly than it now is, before it could be as thick as No. 2. This would give thirty-five inches for No. 1, eight for No. 2, and eight for the interval between them, or a total of four feet and a quarter for the siphuncle only, which, even then, would be imperfect at both ends.

In their proportionate thickness and probably submarginal position, as well as in the irregularity and gradual expansion of their endosiphons, these siphuncles seem to agree better with those of *Endoceras* than with those of *Orthoceras* proper. Although no clearly defined sheath or sheaths have yet been detected in them, they appear to be most nearly related to that section of the genus *Endoceras* which Professor Hyatt has differentiated under the name *Sannionites*, Waldheim, and in this view of their affinities the writer's opinion has recently been endorsed by Professor Hyatt. Specifically, they seem to differ from the type of *Orthoceras Simpsoni*, Billings (which may be an *Endoceras*) in their huge size and proportionate thickness, but, more especially, in their more rapid increase in thickness, though this increase is still so very gradual as to be not readily appreciable in the comparatively short fragments that are usually obtained.

Orthoceras Simpsoni, Billings.

Plates VII, figs. 2, 2a and 3 and VIII, fig. 1.

Orthoceras Simpsoni, Billings. 1859. In Hind's Rep. Assinib. and Saskatch. Expl. Exped., p. 186, pl. i, fig. 1.

The type of this species, which is still preserved in the Museum of the Geological Survey, was collected by Professor H. Youle Hind in 1858 at Cat Head, on the western shore of Lake Winnipeg and is thus described by the late E. Billings, "The specimen is a portion of the siphuncle, nine inches and one-fourth in length, eleven lines at the larger extremity, and ten at the smaller. It is nearly cylindrical, with a broad, shallow constriction above and below each of the narrow annulations which mark the attachment of the septa. There are eight of these septal rings at the following distances from each other, commencing at the smaller extremity. Between the 1st and 2nd, fourteen lines; 2nd and 3rd, twelve lines; 3rd and 4th, ten and a half lines; 4th and 5th, thirteen and a half lines; 5th and 6th, fifteen lines; 6th and 7th, thirteen and a half lines; 7th and 8th, twelve and a half lines. The annulations are nearly at right angles to the length, and we must infer from this fact either that the septa are scarcely at all concave, or that the siphuncle must be central or very nearly so. If in an orthoceratite the septa are flat then, no matter whether the siphuncle be central or not, the septal annulations must be at right angles, but if the septa are concave then the annulations will be oblique if the siphuncle be at all removed from the centre. My impression is, that this is a large orthoceratite with distant septa and a nearly central siphuncle, since the annulations have a scarcely perceptible obliquity.

"It is one of those species in which the siphuncle became gradually filled with a solid

calcareous animal secretion, with the exception of a narrow cylindrical channel along the centre. This central canal is clearly indicated in the specimen and has a diameter of nearly two lines.

"Dedicated to Sir George Simpson, Governor of the Hudson's Bay Company."

Since this description was published, a few specimens of siphuncles with very similar characters to those of *O. Simpsoni*, and which are therefore probably referable to that species, have been collected at each of the following localities in or on Lake Winnipeg. Commissioners' (formerly called Cranberry) Island, seven miles east of Cat Head, D. B. Dowling, 1890; Swampy Island, ten miles north-east of Cat Head, J. B. Tyrrell, 1889, and D. B. Dowling and L. M. Lambe, 1890; Black Island and Snake Island, Messrs. Dowling and Lambe, 1890; and Dog's Head (two or three miles east of Snake Island) T. C. Weston, 1884, and L. M. Lambe, 1890.

Some of the specimens from these localities are much longer and of course proportionately thicker than the type from Cat Head, but the increase in thickness in all of them is so slow as to be scarcely appreciable. In the type, the septal annulations certainly cross the siphuncle at nearly right angles, as described by Mr. Billings and as represented in his figure, a reproduction of which, in outline, is given on Plate VII, fig. 2, but in the majority of specimens here referred to *O. Simpsoni*, which have been collected since, this is by no means always the case. Thus, in a specimen from Dog's Head, which is nearly two feet long and a portion of which is represented in outline on Plate VII, fig. 3, the septal rings cross the siphuncle somewhat obliquely.

The only specimen, presumably referable to this species, in which any remains of the septa and outer shell are preserved, as well as the siphuncle, is the large fragment from Swampy Island represented in outline by figure 1 of Plate VIII. This specimen, which is about four inches in length and not quite three inches and a half in breadth, has been worn down on one side in such a way as to give a natural and longitudinal section of the shell, showing the edges of the septa and the lateral margins next to the test, as well as the siphuncle. The latter is seen to be eccentric and sublateral but not quite marginal, and to occupy, at its thickest part, rather more than one-third of the entire diameter. As exposed in this section, the septa are seen to be rather deeply concave internally, but the nature of the markings of the exterior of the test is still unknown.

Orthoceras semiplanatum. (Sp. Nov.)

Plate VIII, figs. 3 and 3a.

Shell compressed subcylindrical, increasing very slowly in thickness (at the rate, so far as can be ascertained, of three millimetres and a half in a length of five centimetres), nearly planoconvex in transverse section, one side being broadly and very gently convex and the other nearly flat, the shorter of the two diameters of the tube being about one-third less than the longer, and the lateral margins narrowly rounded. Surface markings unknown; sutures of the septa shallowly concave on the flattened side, slightly convex on the other, and closely approximated, the six interior chambers together measuring half an inch, on the median line of the flattened side; siphuncle small, cylindrical, placed close to the margin of the convex side.

Lower Fort Garry, Dr. R. Bell, 1880: an imperfect and not very well preserved cast of the interior of the shell, not quite three inches and a half in length, and showing two inches and four-tenths of the body chamber, with about an inch of the septate portion. The species resembles the *O. planoconvexum* of Hall, from the Trenton limestone of Wisconsin, in its planoconvex transverse section and in the close approximation of its septa, but differs therefrom in its much less rapid increase in thickness, less compressed sides, and, more particularly, in the entirely different position of its siphuncle, which latter, in *O. planoconvexum*, is said to be "centrally situated on the flattened side."

Orthoceras Selkirkense. (Sp. Nov.)

Plate VIII, figs. 2, 2a and 2b.

Shell very nearly cylindrical, but increasing in thickness at the rate of about one millimetre in two inches, slightly compressed in the dorso-ventral region, the outline of its transverse section being rounded elliptical, with the larger diameter about one-fourth larger than the smaller. Surface marked with narrow but very prominent distant annulations, or transverse raised ridges, separated by flat intervals, which are about half as broad as the maximum diameter of the tube, and transversely costulate where the test is well preserved. Septa remote, each of the larger annulations of the test marking the commencement of a new septum, and shallowly concave internally, as seen in longitudinal sections through the centre of the tube; siphuncle rather large, placed near the margin of one of the flattened sides, and slightly contracted at the septa. Chamber of habitation unknown.

The largest specimen collected is not quite five inches in length. At a distance of a little more than half an inch from its smaller extremity its maximum diameter is twenty-five millimetres, and at about a quarter of an inch from its larger end the greatest thickness is twenty-seven millimetres.

East Selkirk, Manitoba; two specimens, both collected in 1884, one by Mr. T. C. Weston and the other by A. McCharles.

Orthoceras Winnipegense. (Sp. Nov.)

Plate VIII, figs. 4, 4a and 4b.

Shell narrowly elongated, somewhat fusiform, very slightly inflated in advance of the midlength; outline of transverse section nearly rounded but approaching to elliptical. Septate portion cylindro-conical, and increasing very slowly in thickness; chamber of habitation broadly but shallowly constricted in the middle, and a little narrower at the aperture than at its commencement. Surface markings unknown, though the interior of the test is marked by closely disposed and exceedingly minute, transverse raised lines. Septa, as shown in the longitudinal section represented by fig. 4b, seven millimetres and a half apart at the smaller end, and eight mm. at the larger, as measured at their broadest part, next to the siphuncle; siphuncle slightly eccentric, narrow, almost cylindrical, but faintly constricted at the septa.

Black Island, Lake Winnipeg, a little to the west of Swampy Island, two specimens; and at the south end of Swampy Island, about eight miles from Black Island, one specimen; all three collected by Messrs. Dowling and Lambe in 1890.

The specimen figured, which is from Black Island, has about three inches of the chamber of habitation preserved and a little more than three inches and a half of the septate portion. The specimen from Swampy Island, which is septate throughout but imperfect at both ends, is five and a half inches in length, by about thirty-six millimetres in its maximum diameter at the larger end and twenty-nine at the smaller.

Actinoceras Richardsoni, Stokes.

Plate IX, figs. 1, 2, and 2a.

Actinoceras Richardsoni, Stokes. 1840. Trans. Geol. Soc. Lond., ser. 2, vol. v, pt. 3, p. 708, pl. lix, figs. 2 and 3.
? Ormoceras Brongniarti. D. Dale Owen. 1852. Geol. Rep. Wiscons., Iowa and Minn., p. 181.
Actinoceras Lyoni, Whiteaves. 1880. Geol. Surv. Can., Rep. Progr. 1878-79, pp. 460 and 48c, of Appendix 1.
Actinoceras Richardsoni, Foord. 1888. Cat. Foss. Ceph. Brit. Mus., Pt. 1, p. 172.

"From Lake Winnipeg, in yellowish-white limestone much resembling that from Igloolik," Stokes. Probably from the first and second limestone points on the west side of Lake Winnipeg, north of the Saskatchewan where it was collected by Sir John Richardson on Franklin's first expedition in 1814 and subsequently by Captain Back in 1832. Lower Fort Garry (Stone Fort) on the Red River, D. Dale Owen, 1848, Dr. Hector, 1857, Donald Gunn, 1858, Dr. Selwyn, 1872, Dr. R. Bell, 1879 and 1880, and T. C. Weston and A. McCharles, 1884; apparently abundant. East Selkirk, T. C. Weston and A. McCharles, 1884.

This species is represented in the Museum of the Survey by a fine series of specimens from the Red River valley. These show that the rate of tapering in some specimens is rather more rapid than has generally been supposed. Thus, in the original of fig. 1, on Plate IX, in a length of four inches the maximum diameter of the shell increases from thirty-seven millimetres at the smaller end to sixty at the larger. The outline of a transverse section is usually circular, except when the specimen has been abnormally compressed. The surface markings consist of rather regularly disposed transverse and imbricating striæ. The septa, as described by Mr. Foord, are "four lines distant where the shell has a diameter of three inches," and arch strongly forward and outward. The very large, submarginal and nummuloidal siphuncle varies in its proportionate size in different specimens, though its maximum diameter is usually more than half that of the shell. It is very strongly inflated between the septa and both acutely and narrowly constricted at the places where they join it. In the longitudinal section of a specimen of this species represented by figure 2 of Plate IX, the posterior segment of the siphuncle is thirty-six millimetres in maximum breadth and nine in height, while the last perfect segment anteriorly is forty-seven mm. in its greatest breadth, by ten in height. The endosiphon and the lateral tubuli which proceed from it, are all well shown in this and other similar sections.

Figures 3 and 3a, on Plate IX, represent the apical extremity of what appears to be

an abnormally flattened specimen of this species, in which the outline of a transverse section at the larger end (fig. 3a) is elliptical and not circular.

Actinoceras Bigsbyi, Bronn.

Plate X, fig. 2.

Orthoceræ . . . Bigsby. 1824. Trans. Geol. Soc. Lond., ser. 2, vol. I, p. 198, pl. xxv, figs. 1 and 2 (but not 3).
Actinoceras Bigsbyi, Bronn. 1837. Lethœa Geogn., Bd. I, p. 98, Taf. i, f. 8 (after Bigsby).
" " Stokes. 1840. Trans. Geol. Soc. Lond., ser. 2, vol. v, pt. 3, p. 707.
Actinoceras Lyoni, Stokes. 1840. *Ib.*, p. 707, pl. lix, fig. 1.
" " Castelnau. 1843. Syst. Sil. de l'Amerique Septentrionale, p. 32, pl. xvii, figs. 1, a, b.
Ormoceras tenuifilum, Hall. 1847. Pal. N. York, vol. I, p. 55, pls. xv, xvi, and xvii, figs. 1, a, b.
Ormoceras Lyonii, Hector. 1861. Quart. Journ. Geol. Soc. Lond., vol. XVII, p. 439 (Salter's determination).
Orthoceras Bigsbyi, Billings. 1863. Geol. Canada, p. 149, figs. 107 a, b, and appendix, p. 949.
Orthoceras (*Actinoceras*) *Bigsbyi*, Barrande. 1874. Syst. Silur. de la Bohême, vol. I, Texte iii, p. 734, and pls. ccxxxi, figs. 4 and 5 (copied from Dr. Bigsby) and ccccxxxvii, figs. 10–16.
Orthoceras (*Ormoceras*) *tenuifilum*, Barrande. 1874. *Ib.*, p. 754, pl. ccxxxvii, figs. 5–7.
Actinoceras Bigsbyi, Foord. 1888. Cat. Ceph. Brit, Mus., p. 168.

Lower Fort Garry, Dr. Hector, 1857. East Selkirk, A. McCharles, 1884; a siphuncle sixteen inches long and quite perfect posteriorly. Swampy or Beren's Island, Lake Winnipeg, J. B. Tyrrell, 1889; three specimens, two with the apical extremity preserved, with its large foramen, and all with a considerable portion of the test remaining, though its surface is weathered. Black Island, near Swampy Island, one specimen, in a similar state of preservation to those from Swampy Island; and Big Sturgeon Island, a portion of a siphuncle, Messrs. Dowling and Lambe, 1890. Mouth of the Fisher River, Lake Winnipeg, D. B. Dowling, 1891; a portion of a siphuncle.

The type of this species is from Thessalon Island, Lake Huron, where it was collected by Dr. Bigsby in 1820. In the "Geology of Canada" (1863) *A. Bigsbyi* is recorded as occurring, in Ontario, on Campement d'Ours Island, on the Palladeau, Manitoulin and Lacloche Islands and on Snake Island, in Lake Huron,—at Loughborough, Dickson's Mills near Pakenham, and Cornwall; in Quebec, at Pointe Claire (on the island of Montreal), Montreal, St. Ambroise and Lake St John. The specimens from Montreal are from the Trenton limestone, but all the others from the localities just cited, in the provinces of Ontario and Quebec, are from the Black River limestone.

The "longitudinal, undulated, thread-like lines" which are said to be characteristic of the outer surface of the shell of *A. Bigsbyi* are very rarely preserved. No traces of these surface markings can be detected in any of the specimens from Manitoba, and scarcely any in those from Ontario or Quebec. The species, however, can always be recognized by its very peculiar siphuncle, which is usually well preserved. The longitudinal section of a specimen from Black Island represented on Plate X, fig. 3, shows the opening of the large foramen directly into the endosiphon posteriorly, and some of the lateral canals or tubuli which radiate first outward and then outward and forward, from the endosiphon. Not a vestige of the chamber of habitation of this species, nor of that of *A. Richardsoni*, have yet been discovered.

Actinoceras Allumettense, Billings. (Sp.)

Plate X, figs. 3 and 3a.

Orthoceras Allumettense, Billings.	1857.	Geol. Surv. Canada, Rep. Progr. 1853-56, p. 331.
" " Barrande.	1870.	Syst. Silur. de Bohême, vol. II, pl. ccccxxxvii, figs. 6-9.
" " "	1874.	*Ib.*, texte iii, p. 729.

Lower Fort Garry, Dr. R. Bell, 1880: a single specimen, of which a longitudinal section is figured. The specimen is a little more than six inches in length, by nineteen millimetres in its maximum diameter at the smaller end and thirty-six at the larger. It is here identified with the present species, with some confidence, after a careful comparison with four of Billings' types of *O. Allumettense*, from Paquette's Rapids, on the Ottawa River. A specimen collected by Messrs. Dowling and Lambe at Black Bear Island, Lake Winnipeg, in 1890, which consists of a natural but much weathered longitudinal section of the shell, about eight inches in length, in a piece of rock, is also probably referable to this species.

A. Allumettense seems to be intermediate in its characters between *Actinoceras* and *Sactoceras*, and should, perhaps, be referred to the latter genus rather than to the former. Still, in the *Orthoceras Richteri* of Barrande, which is stated by Professor Hyatt to be the type of his genus *Sactoceras*, the height and breadth of the siphuncular segments, which are moniliform rather than nummuloidal, are represented as nearly equal, whereas in *A. Allumettense* these segments are nearly twice as broad as high, and therefore more nearly nummuloidal.

Sactoceras Canadense. (Sp. Nov.)

Plate X, figs. 1 a–c.

Shell narrowly elongated, rather slender, somewhat fusiform, cylindro-conical and increasing very slowly in thickness from the posterior end to a short distance beyond the midlength, thence narrowing slightly to the aperture; length about six times greater than the maximum thickness; dorsal and ventral regions compressed, though perhaps abnormally so, the outline of a transverse section through the thickest part, near to the body chamber, being broadly elliptical. Septate portion, in the only specimen known to the writer, occupying about two-thirds of the entire length, and divided into seventeen chambers, its apical extremity obtusely pointed; chamber of habitation nearly cylindrical, though its maximum diameter is about six millimetres greater at its commencement posteriorly than at the aperture. Surface markings unknown. Septa shallowly concave externally in the dorsal and ventral regions, their distances apart averaging about one-third the maximum diameter, except the two or three last formed, which are rather closer together. Siphuncle, as seen in a longitudinal section of the specimen, eccentric, submarginal, very large and much swollen between the septa posteriorly, but ultimately much diminishing in size towards the chamber of habitation. At the apex, posteriorly, nearly the whole of the first chamber is filled up with the first segment of the siphuncle, which is twelve millimetres in its maximum diameter. In the next five or six chambers, the siphuncular segments fill the greater part of the space, and average from fifteen to six-

teen millimetres in their maximum diameter, after which the siphuncle decreases so rapidly in size that in the fourth chamber from the body chamber, the maximum diameter of the segment therein contained is only five mm. Dimensions of the specimen figured and described; total length, about nine inches, or 23 cm.; greatest thickness, 36 mm.; length of the septate portion of the shells, as measured in the median line of the section, 14.6 cm.; greatest diameter of the body chamber, 35 mm. posteriorly and 29 mm. anteriorly.

Swampy or Beren's Island, Lake Winnipeg, J. B. Tyrrell, 1889: one nearly perfect cast of the interior of the shell, with the whole of the siphuncle and septa well preserved.

The internal structure of this species is essentially similar to that of the *Orthoceras docens* of Barrande, which Professor Hyatt regards as an aberrant member of his genus *Sactoceras*, but the external contour of these two shells seems to be quite different. The remarks which Professor Hyatt makes upon *S. docens*, however, are quite as applicable to the Canadian species. In reference to the former, he states that "it is a transition form, but we place it in this genus because at an age when an *Actinoceras* would have the rosettes large and perfect, this species begins to lose them, and the siphon decreases also. The reduction of the siphon is a degradational senile shrinkage, and it occasions the loss of the rosettes. M. Barrande views this old stage of the siphon as a return to the tubular siphon, but in our opinion we cannot call this a tubular siphon. As a matter of fact it is a modified nummuloidal siphon, as may be seen by comparison with others."

Gonioceras Lambii. (Sp. Nov.)

Plate XI, figs. 1, 1a–b.

Shell large, its body chamber unknown, the septate portion elongated, compressed conical, but increasing very slowly in size, strongly compressed on the dorsum and venter and broadly expanded at the sides, which are ultimately sharply angulated; lateral diameter a little more than twice the dorso-ventral, the exact proportions being as two to five; outline of transverse section nearly lenticular, though the venter is a little flatter than the dorsum. Surface markings unknown. Septa rather closely approximated, their sutures averaging from ten to eleven millimetres apart on the median line of the dorsum, each suture being broadly concave on the dorsum and venter, and produced into a large, obtusely pointed saddle on each of the lateral angles. Siphuncle ventral, marginal, strongly inflated between the septa, but very small proportionately, its thickest portion occupying not much more than one-seventh the maximum diameter of the tube. The constrictions between the siphonal inflations are very deep, and, when viewed in longitudinal section, appear as narrow incisions which cut obliquely backward and inward, on each side, thus giving a very peculiar appearance to the siphuncle.

Approximate dimensions of the specimen described: length rather more than ten inches; maximum diameter, at the smaller end, five inches, the corresponding diameter at the larger end being six inches and a half.

The writer desires to associate this interesting species with the name of his friend and colleague, Mr. L. M. Lambe, F.G.S., who collected the only known specimen at East Selkirk in 1880. It differs from the type of the genus, the *G. anceps* of Hall, in its much greater size, in the less rapid rate of tapering of its expanded sides, in the greater

proportionate convexity of its dorsum and venter, and, more especially, in the much smaller size and peculiar shape of its siphuncle. From the *G. occidentale*, Hall, of the Trenton limestone of Wisconsin, it differs in the regularity of its lateral expansion, in the nearly equal convexity of its dorsum and venter, in the absence of "retral curves" to the septa, as well as in its very much smaller and differently shaped siphuncle.

Poterioceras nobile.

Poterioceras nobile, Whiteaves. 1890. Trans. Royal Soc. Can., vol. vii, sect. 4, p. 77, pl. xiv, fig. 1.

So far as the writer is aware, no other examples of this species have been collected than the two obtained by Mr. Weston in 1884 at East Selkirk and Lower Fort Garry.

Poterioceras apertum.

Plate XI, figs. 2 and 3.

Poterioceras apertum, Whiteaves. 1890. Trans. Royal Soc. Can., vol. vii, sect. 4, p. 78, pl. xiv, figs. 2–4.

Since this species was described, a few additional specimens have been collected by Messrs. Dowling and Lambe, in 1890, at Cat Head, Lake Winnipeg, and at Black Island, near Swampy Island; also by Mr. Dowling, in 1891, at Dog Head.

In Professor Blake's original description of *P. intortum* (which, by the way, seems to be very closely allied to *P. apertum*) the following sentence occurs: "The shell thickens near the aperture, but at last a sudden inbending takes place to an opening much smaller than the general section. This may, of course, be an abnormal feature." The thickening of the shell towards the aperture and its "sudden inbending" are so well shown in the two specimens of *P. apertum* from Black Island, represented on Plate XI, that these characters can scarcely be considered as accidental or even abnormal. The original of fig. 2, on Plate XI, is slightly and rather irregularly worn down in the siphonal or ventral region, in such a way as to give a natural and longitudinal section of the whole shell, very near to the surface. Posteriorly, the weathering of this specimen exposes six or seven of the septa and five segments of the very eccentric siphuncle. Anteriorly, it gives a section of the whole of the body chamber, and, more particularly, of the thickening and inbending of the test at the aperture, though in this particular specimen the thickening and inbending happen to be very slight. The specimen whose aperture only is represented by fig. 3 on Plate XI is so weathered as to give a natural and longitudinal section of part of the shell, but the section at the aperture is nearly through the centre of the latter. In this specimen the thickening and infolding of the test at the aperture are strongly marked, the test being fully six millimetres thick at its recurved extremity, and the aperture itself appreciably diminished in size by the infolding of the lip.

Poterioceras gracile. (Sp. Nov.)

Plate XII, figs. 4 and 4a.

Shell fusiform, strongly compressed, straight and rather slender, flattened conical and

obtusely pointed posteriorly, thickest at the midlength, where it is very gently convex, thence narrowing gradually and very slightly towards the aperture, which apparently is simple and broadly truncated; immediately behind the aperture there is a faint annular constriction; siphonal and antisiphonal regions narrowly rounded; sides compressed, somewhat expanded, especially at the midlength and anteriorly; chamber of habitation occupying about one-third of the entire length, which latter is more than twice but less than three times the maximum breadth; outline of transverse section, in the thickest part, elliptical, with the longer axis of the ellipse not quite twice the length of the shorter; surface showing indications of fine transverse costæ, though the exterior of the test is not very well preserved. Septa rather closely approximated and averaging about three millimetres apart; siphuncle nearly marginal, moniliform, and slightly inflated between the septa, the maximum breadth of each siphuncular segment being one-third less than its height or depth.

Approximate dimensions of the only specimen collected: length eighty-six millimetres; greatest dorso-ventral diameter,* thirty-three mm.; maximum lateral diameter, nineteen mm.

Black Island, near Swampy Island, Lake Winnipeg, Messrs. Dowling and Lambe, 1890.

In its broadest aspect, as represented by fig. 4, the posterior end of the specimen is almost if not quite equilateral. The position of the siphuncle of this species was discovered and its characters ingeniously elucidated by Mr. Lambe, to whom the writer is indebted for valuable assistance in working out the internal structure of some of the other species described in this paper.

OTTAWA, December 5th, 1891.

EXPLANATION OF PLATES.

With the exception of figure 1 on Plate VI, and figures 1, 1a and 1b on Plate XI, all the figures are of natural size.

PLATE V.

ENDOCERAS ANNULATUM. Var. (Page 77.)

Fig. 1.—Side view of the most perfect specimen collected.
1a.—Outline of transverse section of the same, at the place indicated by the letter S on fig. 1.

ENDOCERAS SUBANNULATUM. (Page 78.)

Fig. 2.—Posterior end of the largest and most perfect specimen collected.
2a.—Outline of transverse section of the same, at S, on fig. 2.

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* Assuming that the siphuncle is placed near the venter.

PLATE VI.

ENDOCERAS CRASSISIPHONATUM. (Page 79.)

Fig. 1.—Outline of the longest and most perfect siphuncle collected, one-fourth the natural size.

2.—Longitudinal section of a portion of another siphuncle, shewing the gradual and irregular widening of the endosiphon anteriorly.

3.—Longitudinal section of a portion of a siphuncle, shewing the narrow posterior part of the endosiphon, with, apparently, a few distant transverse dissepiments.

4.—Longitudinal section of the thickest portion of a siphuncle of this species known to the writer, shewing the widening outward of the endosiphon anteriorly. At its narrower end the endosiphon is nearly filled with an adventitious fragment of an Orthoceratite.

PLATE VII.

ENDOCERAS CRASSISIPHONATUM. (Page 79.)

Fig. 1.—Exterior of the specimen represented on Plate VI, fig. 4. The upper part of the figure is an outline of a transverse section at S, shewing the proportionate size of the endosiphon anteriorly.

ORTHOCERAS SIMPSONI. (Page 79.)

Fig. 2.—Reproduction, in outline only, of Mr. Billings' original figure of the type of this species.

3.—Portion of a siphuncle, supposed to be referable to this species, from Dog's Head, Lake Winnipeg, to shew the obliquity of the septal annulations.

3a.—Outline of transverse section of the same, at S.

PLATE VIII.

ORTHOCERAS SIMPSONI. (Page 80.)

Fig. 1.—Natural and longitudinal section of a portion of a cast of the interior of a shell which is supposed to belong to this species, shewing some of the septa and the lateral margins next to the test. Rather less than one-half of the specimen has been worn down, and the dotted lines indicate the outline of the siphuncle as it would have appeared if the section had been through the middle of both shell and siphuncle.

1a.—Outline of transverse section of siphuncle of the same at S, to shew the proportionate size of the endosiphon.

ORTHOCERAS SELKIRKENSE. (Page 82.)

Fig. 2.—Lateral view of the most perfect specimen in the Survey collection, shewing the shape and surface markings of the species.

2a.—Longitudinal section of a part of the same, to shew the characters of the siphuncle and septa.

2b.—Outline of transverse section of the original of fig. 2, at S.

ORTHOCERAS SEMIPLANATUM. (Page 81.)

Fig. 3.—Dorsal aspect of the only specimen in the Survey collection.

3a.—Outline of transverse section of the same specimen, at S, to shew the size and relative position of the siphuncle.

ORTHOCERAS WINNIPEGENSE. (Page 82.)

Fig. 4.—Lateral view of the most perfect specimen known to the writer.

4a.—Outline of transverse section of the same, at S.

4b.—Longitudinal section through the septate portion of the same.

PLATE IX.

ACTINOCERAS RICHARDSONI. (Page 83.)

Fig. 1.—Exterior of a specimen from Lower Fort Garry, to shew the general shape and surface ornamentation.

2.—Longitudinal section of another specimen, from St. Andrews, Manitoba, to shew the characters of the siphuncle and septa.

2a.—Outline of transverse section of the same, at S. The dotted line in this figure shews where the longitudinal section represented in fig. 2 was made.

3.—Posterior and apical end of a specimen from East Selkirk, supposed to be an abnormally flattened example of this species, a part of which has been cut longitudinally, to shew the siphuncle and septa.

3a.—Outline of transverse section of the same, to shew the relative proportions and position of the siphuncle and endosiphon.

PLATE X.

SACTOCERAS CANADENSE. (Page 85.)

Fig. 1.—Exterior view of the only specimen in the Survey collection, which is a cast of the interior of the shell.

1a.—Another view of the same specimen, with most of the septate portion cut longitudinally, to shew the large size of the siphuncle posteriorly and its extreme diminution anteriorly.

1b.—Outline of transverse section of the same, at S 1.

1c.— " " " " " " " at S 2.

ACTINOCERAS BIGSBYI. (Page 84.)

Fig. 2.—Longitudinal section of a specimen from Black Island, in which the apical extremity is preserved, shewing the opening of the large foramen into the endosiphon posteriorly and some of the lateral canals or tubuli which radiate outward and forward from the endosiphon.

ACTINOCERAS ALLUMETTENSE. (Page 85.)

Fig. 3.—Longitudinal section of the only specimen known to the writer from the Trenton limestone of Manitoba, to shew the characters of both siphuncle and septa.

3a.—Outline of transverse section of the same, at S. The dotted lines indicate the place where the longitudinal section was made.

PLATE XI.

GONIOCERAS LAMBII. (Page 86.)

Fig. 1.—Antisiphonal and presumably dorsal side of the only specimen in the Survey collection, one-half the natural size.

1a.—Siphonal and presumably ventral side of the same, partly cut longitudinally, to shew the characters of the siphuncle and septa. One-half the natural size.

1b.—Outline of transverse section of the same, at S. The dotted lines indicate the place where the longitudinal section seen in fig. 1a was made.

POTERIOCERAS APERTUM. (Page 87.)

Fig. 2.—Specimen which has been slightly worn down on the siphonal side, shewing the septa, part of the siphuncle, and the sudden inbending of the test at the aperture.

3.—Aperture of another specimen, as seen in a natural and longitudinal section nearer the centre, and shewing the sudden imbending and thickening of the test, as described also on page 87.

POTERIOCERAS GRACILE. (Page 87.)

Fig. 4.—Lateral view of the type specimen of this species. The dotted lines indicate the place where the piece was cut out, as represented in the next figure.

4a.—Siphonal and presumably ventral view of the same, with a piece cut out of the anterior end of the septate portion, to shew the position and character of the siphuncle.

4b.—Outline of transverse section of the same specimen, at S.

VIII.—*Three Deep Wells in Manitoba.*

By J. B. TYRRELL, M.A., B.Sc., F.G.S.

(Communicated by Dr. G. M. Dawson and read May 28, 1891.)

INTRODUCTION.

(Gave a short account of the pre-tertiary geology of Manitoba, of which the following is an *abstract.*)

The eastern side of Lake Winnipeg consists of Laurentian gneisses and granites, and Keewatin traps, agglomerates, quartzose sandstones, conglomerates, etc. The undulating surface of these crystalline rocks declines gently to the west beneath the palæozoic beds.

The palæozoic rocks consist of the following series :—

Chazy (*St. Peters*) formation, represented by about a hundred feet of white quartzose sandstone, with generally well-rounded grains, running down, at the bottom, into a quartzose conglomerate.

Trenton formation, consisting at the bottom of a mottled buff and grey dolomitic limestone, found at Big and Swampy Islands, etc., and probably also at East Selkirk, above which are other horizontal evenly bedded limestones and dolomites, amounting in all to a few hundred feet, and all more or less rich in fossils.

Hudson River Formation represented by less than a hundred feet of fossiliferous shales and dolomites.

Niagara formation, recently discovered by the writer on the lower part of the Saskatchewan river, and on the east side of Lakes Winnipegosis and Manitoba. As shown in the gorge of the Grand Rapids, it consists in its lower portion of about sixty feet of buff, yellow, and white limestone, brecciated at the bottom, and ripple-marked towards the top. Some bands are highly fossiliferous, *Pentamerus decussatus* being the most plentiful and characteristic species, though its vertical range is very small. The upper portion of the formation consists of a considerable thickness of a compact or porous dolomite, often containing many impressions of salt crystals. Its most typical fossils are *Isochilina grandis*, *Leperditia Hisingeri* and *Strophomena acanthoptera*. The highest beds at Stonewall may belong to this terrane.

Guelph.—Near the northeastern angle of Lake Manitoba the typical Niagara dolomites are overlain by a few feet of thick-bedded stromatoporoid magnesian limestone holding *Pycnostylus Guelphensis*, which may be of the above age.

Over these Silurian limestones there is in the lacustral region a gap in the known section, probably due to the presence of soft argillaceous shales. A few feet of soft red shales are the first beds seen above this gap, and are apparently of Devonian age.

The *Devonian*, above these shales, consists at the bottom of a hundred feet or more of harsh porous dolomites, containing *Pentamerus comis*, etc., overlain by a similar thickness of tough white dolomites containing *Stringocephelus Burtoni*. Above these dolomites are fifty to seventy feet of calcareous shales marked by many brine springs along their line of outcrop; above these is a highly fossiliferous limestone containing great beds of *Atrypa reticularis*, and these again are overlain by light grey compact brittle limestones which represent the local top of the Devonian.

As far as could be seen the Palæozoic terranes are practically conformable and almost undisturbed throughout.

On the eroded and slightly undulating surface of the Devonian the Cretaceous sandstones and shales were deposited.

Boring at Deloraine.

This well was sunk by William Ward for the town of Deloraine, which is situated at the terminus of the Pembina Mountain branch of the Canadian Pacific Railway. The town is in the southeast quarter-section of section 10, township 3, range 23, west of the principal meridian, in Manitoba. The well is about a hundred yards north of the railway station, on a level alluvial or lacustral plain stretching northward from the base of the Turtle Mountain towards the Souris river. It was begun in November, 1888, in the hope of finding a large supply of water at a moderate depth, as there is no permanent stream in the vicinity, and the water of Whitewater lake, which lies on the plain about three miles distant, is quite highly charged with sulphate of soda and other saline ingredients.

The machinery used was a percussion drill, supported by jointed rods, and worked by a small stationary engine. The well is cased to the bottom with iron tubing, and the drillings are raised with an ordinary sand pump. In many parts of the bore water had to be poured in to enable the drill to work and the drillings to be removed.

In June, 1889, the boring had reached a depth of 975 feet, and up to that time no clearly-marked specimens had been kept, and the log is given below very much as it was received from the driller.

At a depth of 1050 feet the collection of a systematic series of specimens from every five feet was begun, and was carried down to 1285 feet, between which depth and 1335 feet six specimens were obtained, numbered merely in consecutive order. This latter depth was reached in October, 1889, and then operations were suspended for a short time through lack of the necessary funds to continue the work. During this month the writer paid a short visit to Deloraine, examined as far as possible the work done up to that date, and obtained from Messrs. Stuart, Martin and Cowan the specimens collected. In company with the same gentlemen a visit was also paid to the northern boundary of the Turtle Mountain, and the beds composing it were hastily examined.

During the following winter work on the well was resumed with the assistance of grants from the Canadian Government and the Canadian Geological Survey, and with very few exceptions specimens have been kept from every five feet down to a depth of 1660 feet. Below 1660 feet the rock is stated by Dr. Selwyn, who has lately visited the well, to be a similar clay shale throughout, and the specimens collected corroborate this statement.

The following is a synopsis of the log as at present determined :—

Height of Surface in Feet Above Sea Level, 1,644.					
No.	DESCRIPTION.	Thickness of layer in feet.	Depth of bottom of layer from surface.	Height in Feet above Sea.	FORMATION.
1	Black soil	3	3	1641	
2	Clay, with some small pebbles	30·5	33·5	1610·5	Pleistocene. 91 feet.
3	Hard blue clay, with pebbles	56·5	90	1554	
4	Fine black sand and gravel	4	94	1550	
5	Light blue-grey shale	56	150	1494	Pierre. (Odanah Series.) 292 feet.
6	Black sand, with water	·5	150·5	1493·5	
7	Blue shale	235·5	386	1258	
8	Soapstone, with thin layers of lime rock	401	787	857	Pierre. (Millwood Series.) 664 feet.
9	Blue clay, with round "*boulders*"	188	975	669	
10	Dark blue-grey shale	75	1050	594	
11	Grey shale	25	1075	569	Niobrara. 545 feet.
12	Mottled grey calcareous shale	200	1275	369	
13	Dark non-calcareous, or but very slightly calcareous, shale	135	1410	234	
14	Grey calcareous shale	185	1595	49	
15	Dark non-calcareous shale	205	1800	156	Benton.

Nos. 1 and 2.—These are not improbably stratified deposits laid down in the bottom of the post-glacial Lake Souris, which stretched northward from Turtle Mountain and covered the country for many miles around Deloraine. Near the foot of the mountain the land in places becomes gravelly, and occasionally a few boulders are scattered over it. A couple of miles south of Deloraine the surface rises in an easy slope for about fifty feet to a wide, even terrace that runs back to the base of the higher and rougher portion of the mountain. It clearly represents one of the shore terraces of an ancient lake, but the extent of the lake has not yet been clearly defined.

No. 3.—This is undoubtedly a hard blue-grey unstratified till with pebbles and boulders. Similar till has been thrown out of the railway tank well at the Deloraine station, which was dug to a depth of a hundred feet, passing through the Pleistocene deposits into the underlying cretaceous shales.

No. 4.—This bed would appear to be a coarser grained till, but whether it differs in age from the till overlying it is uncertain. At the bottom of this layer a moderately strong flow of water was obtained, rising to within twenty-five feet of the top of the well. It is more or less impregnated with sulphate of soda.

No. 5.—A light blueish-grey, moderately hard, non-calcareous clay shale, typical of the Odanah series. Excellent specimens of this shale were obtained from the railway tank well, a few hundred yards to the west. This series has already been described by the writer,[1] and was previously very well described by Dr. G. M. Dawson[2] as the upper portion of his Pembina Mountain Group from exposures in the valley of the Pembina river, etc. During the past summer the same formation was traced in the valley of the Assini-

[1] "The Cretaceous of Manitoba," by J. B. Tyrrell, 'Am. Jour. Sci.,' 3rd series, vol. xxxx, p. 227.

[2] "Geology and Resources of the 49th Parallel," by G. M. Dawson, Montreal, 1878, pp. 81–85.

boine river, from the mouth of Arrow river to the vicinity of Oak lake, on the Canadian Pacific Railway, and near the latter place was found to contain a few fragmentary fish remains, with the shell of an Ostrea ?, and impressions of portions of the prismatic shell of Inoceramus. Prof. Culver[1] also states that similar shale outcrops as far south as La Moure, near the south line of North Dakota, and that in it he succeeded in finding a few fossils, the best an Inoceramus, and casts of a little Baculite. These observations clearly prove an extensive areal development for this series of brittle light grey clay shales, and also that it belongs to the marine Cretaceous of the Western Plains. As was stated in the introduction, it is overlain by the coarse Laramie ? sandstones of the base of the Turtle Mountains.

No. 6.—A considerable flow of water was obtained from this thin band of sandstone. The almost utter absence of sandstone in the Pierre of this section is very noticeable, since sandstone enters so largely into the composition of the same formation farther west.

No. 7.—Apparently the same as No. 5, giving the Odanah series a thickness in this well of 290 feet.

Nos. 8 and 9.—In all probability these are both included in the Millwood series, representing the lower dark-grey shales of the Pierre formation. The "boulders" are nodules of calcareous ironstone such as are found in abundance in this formation on the banks of the Assiniboine river, in the vicinityof Mill wood. Some shells of spiral gasteropods are stated to have been found at a depth of 845 feet, but none were seen by the writer.

No. 10.—This band has been placed at the base of the Millwood series, which thus is given a thickness of 664 feet, but some or all of it may more properly belong to the top of the underlying Niobrara formation. If it were given the latter position it would represent the band of dark unctuous clay with much carbonaceous matter, etc., that is placed at the top of the Niobrara formation in Messrs. Meek and Hayden's Missouri section. A specimen from 1010 feet consists in part of a soft blueish-grey clay shale, and in part of a light grey clayey limestone. Another specimen from near the same depth contains a considerable amount of crystalline pyrite.

No. 11.—A very dark grey soft unctuous and very slightly calcareous clay shale, containing a few fragmentary remains of fishes, and at the top few foraminifera (Anomalina sp.), with the cells filled with pyrite. Mr. Hoffmann, of this Survey, states that the loss from this rock on ignition is 18 per cent, representing the amount of carbonaceous matter and water in the dried material.

This band has been placed at the top of the Niobrara formation in the section, as it is the highest bed from which foraminifera have been definitely recognized.

No. 12.—A mottled grey calcareous shale or marlite, containing, in varying numbers, foraminifera, prisms of the shells of Inoceramus, fragments of fish remains, crystalline masses of pyrite, occasional fragments of the pearly shells of Ostrea, and crystals of selenite. The following list gives the results of the examination of the specimens from every five (or ten) feet :—

1075. Slightly calcareous shale, with fish remains, a few foraminifera, Inoceramus prisms, and crystals of selenite.

1080. Soft moderately calcareous dark-grey mottled clay shale, with small crystals and crystalline masses of pyrite.

[1] A report on the preliminary investigation to determine the proper location of artesian wells, etc. U. S. Senate Document, No. 222, Washington, 1890, p. 59.

1085. Similar shale, with several species of foraminifera, some fish remains, and a large amount of pyrite.

1090. Similar shale, with foraminifera and fish remains.

1100–1105. More calcareous shale, with a large amount of pyrite.

1110. Highly calcareous mottled shale, with fish remains, Inoceramus prisms and many foraminifera.

1115. Dark and light clay shale, both highly calcareous, containing pyrite, prisms of Inoceramus, fish remains, and many species of foraminifera, of which Mr. C. Davies Sherborn has kindly determined the following, viz. :—*Globigerin acretacea*, d'Orb., *G. bulloides*, d'Orb., *Cristellaria rotulata*, Lam., *Planorbulina ammonoides*, Reuss, *Anomalina rotula*, d'Orb., *Bulimina variabilis*, d'Orb., *Textularia globulosa*, Ehr., *Verneuilina triquetra*, d'Orb., *Marginulina variabilis*, Neug.

1120. Very similar shale.

1125. Slightly calcareous clay shale, with fish remains, Inoceramus prisms, a few foraminifera and crystals of selenite.

1130. Soft light-grey clay shale, with many fragments of shells of Inoceramus and Ostrea, and many foraminifera, crystals of pyrite and selenite.

1134–1140. Similar shale, with crystals of pyrite, and a few badly preserved foraminifera and prisms of Inoceramus.

1145–1180. Similar shale or marl, with pyrite, fish remains, Inoceramus prisms and many foraminifera, *Globigerina cretacea* being especially abundant.

1185–1195. Slightly calcareous shale, a few fish remains, crystals of selenite and a few foraminifera.

1205. Slightly calcareous shale, a few fish remains, and irregular fragments of calcite and selenite.

1210–1245. Similar shale, with pyrite, a few fish remains, foraminifera, and prisms of Inoceramus.

1250–1275. Similar shale, with fish remains, prisms of Inoceramus, pieces of shells of Ostrea, a few foraminifera and crystals of pyrite.

No. 13.—The material brought up by the drill in this part of the boring is generally a very dark-grey soft unctuous, and but slightly calcareous clay, from which were separated by washing some fine graphite-like flakes of clay shale. These have much the appearance of the Benton shales elsewhere in Manitoba, and was previously regarded as such by the writer, but as this band comes between two highly calcareous zones, it has been thought advisable to group it in with the Niobrara formation. The following list gives the particulars of some of the beds :—

1280. Dark grey non-calcareous clay shale, with a few fish remains and many crystals of selenite.

1285–1295 ?. Dark slightly calcareous shale, with a few prisms of Inoceramus and fragments of fish remains.

1300 ?. Similar shale, with a few specimens of *Globigerina cretacea*.

1305–1345. Dark unctuous non-calcareous clay shale.

1350. Similar shale, with fragments of a nodule of calcareous ironstone.

1355–1380. Similar shale breaking into minute flakes.

1385. Slightly more compact shale.

1390–1395. Similar shale, with a few crystals of selenite.
1400–1405. Similar shale, without selenite.

No. 14.—This series is a downward continuation of the last, the shale gradually becoming more calcareous, till it appears to terminate in a band of coarse fragmental limestone, called sandstone by the driller. From this limestone band there was a considerable flow of water which rose rapidly in the pipe to within eight feet of the top. The water had a flattish taste from the presence of salts of soda. This limestone band is regarded as the base of the Niobrara formation. The following is a serial description of the beds:—

1410. Dark grey non-calcareous clay shale, with a few rotaline foraminifera, and some moderately large fragments of the shell of Inoceramus.
1415–1425. Similar shale, with a few fragments of fish remains, but no foraminifera.
1430–1445. Similar shale, with a few prisms of Inoceramus.
1450. Lighter grey calcareous clay shale, with large and small prisms of the shells of Inoceramus, pieces of shells of Ostrea, and a few fragmentary fish remains.
1455. Similar shale, with a large number of foraminifera, *Globigerina cretacea* being especially abundant.
1460–1485.—Similar shale, with a few Inoceramus prisms, and a greater or less number of small foraminifera belonging to such genera as Textularia, Anomalina, etc.
1490–1510. A light-grey calcareous shale, with numerous specks of pyrite, many small species of foraminifera, prisms of Inoceramus, and pieces of the pearly shell of Ostrea, and fish remains.
1515–1555. A harder grey calcareous shale, holding similar organic remains, in varying quantities.
1565. Dark grey slightly calcareous thin-bedded shale, holding a few foraminifera, and fragments of fish remains.
1570. Dark grey non-calcareous thin-bedded shale, without organic remains.
1575. Dark grey clay shale, with many fragments of the shells of Inoceramus. With these are a few species of foraminifera of such genera as Textularia, Anomalina, etc., with fragmentary fish remains, and moderately large masses of pyrite. This gritty or fragmental layer formed the sandstone of the driller, and from it quite a large supply of water rose in the tube.
1580–1590. Dark grey clay shale, with a few corroded prisms of Inoceramus, small foraminifera, and fragments of fish remains. When the drillings are washed almost all is carried away in the water as a fine mud. The latter specimen, when drying, became covered with a white efflorescence of sulphate of soda?
1595. Similar shale, breaking down into thin flakes, and containing small cubical crystals of pyrite, prisms of Inoceramus, fragments of fish remains, and pieces of the shell of Ostrea, but no recognizable foraminifera.

No. 15.—Consists throughout, as far as could be determined from the specimens, of a dark-grey, non-calcareous clay shale. In its upper portion it is apparently very bituminous, and breaks into minute flakes, while below it is somewhat lighter in colour, does not break into thin flakes, and contains minute angular grains of clear quartz sand.

The following is a somewhat more detailed categorical description of the beds passed through:—

1600. Dark grey and rather hard fissile clay shale, brought up in fragments, some of which are more than an inch and a half in greatest diameter. It is quite free from calcareous matter, and under the microscope shows no traces of organic remains, but a few globules of pyrite may be seen.

1605–1620. Soft dark-grey unctuous non-calcareous clay shale, breaking into thin, scaly flakes. No trace of organic remains.

1620–1645. Similar shale, with minute fragments of fish remains.

1655. Similar shale with traces of pyrite, mixed with a few particles of fine white soft sandstone, possibly adventitious. The specimen as returned was composed almost entirely of a soft, impalpable clay, and the fragments of shale, etc., were procured by washing a considerable quantity.

1660. Soft dark-grey fissile non-calcareous shale, with a few minute fragments of fish remains, and pieces of concretionary nodules of limestone, and crystalline masses of pyrite.

1665–1715. No specimens received, but stated to be a similar dark-grey shale.

1720. A large proportion of the specimen received is a soft clay that is readily washed away by the water. What remains is a grey non-calcareous clay shale, much lighter in colour than the last, is rather compact, and does not break into thin flakes. It contains a few fragments of fish remains, and some fine irregular angular grains of clear quartz sand.

1730. Similar shale, through which the fine sand is seen to run in thin streaks.

1735. Shale similar to the last with some crystalline aggregates of pyrite, and a considerable number of fragments of a hard, very slightly calcareous fine grained sandstone.

1745. A similar dark grey clay shale, with a few fragments of soft granular sandstone, but without any of the hard sandy fragments seen in the last specimen.

1800. A light grey rather hard fissile non-calcareous clay shale with a few small crystals or crystalline masses of pyrite. Some of the fragments procured were an inch or more in diameter, and in one of them was a small imperfect shell of a Lingula. The well has not yet reached the bottom of the Benton shales.

Boring at Morden.

This boring was drilled by Edward Moore for the town of Morden in the winter and spring of 1889-1890. The town is situated on the Pembina Mountain branch of the Canadian Pacific railway, and the boring is in the middle of the town on the north side of the railway track, and about 150 yards northwest from the railway station, the surface at the well being on a level with the track. It is about a mile from the foot of the Pembina mountain and near the western edge of the level alluvial plain stretching westward from the Red river. The object of the bore was to obtain a large supply of fresh artesian water for the use of the town.

The machinery used was an ordinary percussion drill, and the well was cased first with eight inch tubing, and then with six inch tubing, to below the bottom of the cretaceous rocks.

The writer paid a short visit to Morden in July, 1890, at the time when the work on the boring was discontinued, and obtained specimens of the drillings taken at very irregular intervals. As no systematic and consecutive collection of drillings was kept,

the log is given very much as it was received from Mr. McMillan, the man in charge of the drill, modified by the result of my examination of the specimens. A further statement of the character of these specimens is given after the following table:—

Height of Surface at Boring above Sea Level, 978 Feet.					
No.	Description of Material passed through.	Thickness of layer in feet.	Depth of bottom of layer from surface.	Height above sea.	Formation.
1	Light sandy soil	8	8	970	Alluvium, 15 feet.
2	Quicksand	3	11	967	
3	Quicksand, red	1	12	966	
4	Fine gravel, red	3	15	963	
5	Lead coloured clay, with pebbles	10	25	953	Till, 16 feet.
6	Limestone boulder with fine scratches	2·5	27·5	950·5	
7	Small boulders and shale	3·5	31	947	
8	Dark grey shale	24	55	923	Pierre, 24 feet. (Millwood Series.)
9	Hard streak	·5	55·5	922·5	Niobrara, 160 feet.
10	Dark grey shale	4·5	60	918	
11	Hard streak	3	62	916	
12	Dark grey shale	6	68	910	
13	Hard streak	1	69	909	
14	Dark grey shale	11	80	898	
15	Hard streak, a mixture of stones and shale	1	81	897	
16	Dark grey shale	4	85	893	
17	Black shale, very gritty	1	86	892	
18	Dark grey shale	7	93	885	
19	Black shale, hard and gritty	1	94	884	
20	Grey calcareous clay shale	121	215	763	
21	Dark grey shale	35	250	728	Benton, 105 feet.
22	Soapstone	3	253	725	
23	Dark grey shale	67	320	658	
24	White sand with water	4	324	654	Dakota, 92 feet.
25	White sand with particles of coal	54	378	600	
26	White shale	2	380	598	
27	White sand				
28	Soft grey shale	10	390	588	
29	Black shale	10	400	578	
30	Grey shale with sandstone	12	412	566	
31	Red and grey shale	88	500	478	Devonian, 188 feet.
32	Porous limestone at	.....	500	.....	
33	Red and grey shale	100	600	378	

Nos. 1–4.—These represent the coarse alluvial material deposited near the western shore of Lake Winnipeg, when its waters washed the foot of the Pembina escarpment during the period described by Mr. Warren Upham as that of the McCauleyville beaches. From No. 3 a considerable supply of good water was obtained.

Nos. 5–7.—Evidently till, consisting of harder clay with pebbles and striated boulders.

No. 8.—Was described to me as being precisely the same as the shale outcropping on the sides of the deep valley of Horse Creek, about a mile west of the town. This valley cuts down through the face of the Pembina escarpment and exposes a number of sections of the dark grey clay shales, with many crystals of selenite, typical of the Millwood subdivision of the Pierre shales. No fossils were collected from these exposures, but in the continuation of the same escarpment south of the international boundary line Mr. Warren Upham[1] collected *Baculites compressus* and other typical Pierre fossils.

Nos. 9–19.—In the absence of specimens it is impossible to correlate these beds precisely, either with the base of the Pierre, in which the "hard streaks" would represent layers of ironstone, or with the top of the Niobrara, where they would be bands of fragmental limestone similar to that seen outcropping on the Assiniboine river, below the mouth of Cypress Creek. It is not improbable that the line between the Pierre and Niobrara should be drawn somewhere through this series, as the lower "gritty" portions almost certainly belong to the latter formation. No great error, however, can be committed in grouping these as above.

No. 20.—Evidently to a large extent the mottled calcareous shale of the Niobrara formation. A specimen collected from 125 feet is a light grey, rather hard, mottled, calcareous clay, not splitting very readily along lines of bedding, but breaking into small polygonal masses of moderate size. Many rather large fragments of fish remains are scattered through it. Under the microscope it is seen to contain many small prisms of Inoceramus and a considerable number of foraminifera.

From 135 feet was collected a soft, very light-bluish-grey, non-calcareous clay containing fine acicular crystals of marcasite. From 180 feet the drillings consist of light-grey, non-calcareous clay like the last, mixed with some moderately dark-grey, mottled, calcareous clay, the latter containing a few fragments of fish remains, with many small foraminifera. From 215 feet was obtained a light grey, calcareous, mottled clay shale, breaking evenly, though not very readily, along the lines of bedding. It contains several both large and small species of foraminifera.

Nos. 21–23.—Would appear to represent the soft, unctuous, dark grey fissile, non-calcareous clay shale of the Benton formation. No specimens obtained.

Nos. 24–27.—This is in the main a beautiful white quartz sand, through which are mingled particles of clear white mica. The grains of sand are very irregular, some of them being moderately sharply angular, while others are more or less rounded.

In this sandstone are veins about 15 inches thick of incoherent running sand, one of them being struck at a depth of 360 feet and another at a depth of 377 feet.

At a depth of 324 feet water, strongly charged with chloride of sodium, was struck in a bed of fine white sand, and rose 250 feet in the well within a few minutes, after which it rose more slowly to within six feet of the surface. At one time, when the casing

[1] Upper Beaches and Deltas of the Glacial Lake Agassiz by Warren Upham. Bull, U. S., Geol. Survey No. 39. Washington 1887, p. 79.

was driven below the base of the sandstone and the water pumped out of it, the water from the sides worked under the bottom of the pipes, and, washing in, carried sand along with it, filling the well to a height of 70 feet.

In the sandstone some little particles of coal were said to have been struck.

Nos. 28, 29 and 30.—No specimens were obtained, but No 28 was described as a rotten grey shale, very soft and sticky when cut up by the drill; No. 29 as gritty, strong, black shale, and No. 30 grey shale, similar to No. 28. All through this shale were little bands of sandstone from three to six inches in thickness, and some of the shale was very similar to that overlying the sandstone. The beds evidently represent the base of the Dakota formation, which, in its typical area on the Missouri River, consists of alternating beds of shale and sandstone.

No. 31.—Six specimens of the drillings were kept to represent this 88 feet of rock, numbered in order from above downwards, but whether they represent the whole or only a part of the series is quite uncertain. The record as received gives a red shale similar throughout, from 412 to 440 feet; at 455 feet thin beds of grey shale begin to make their appearance, and lower down this is also stated to be intercalated with thin beds of limestone. The specimens were stated to be characteristic of the whole thickness of beds, and are as follows: No. 1 is a light bluish-grey, soft, argillaceous limestone, with a few grains of well-rounded, clear quartz sand. No. 2, the same, mixed with some red shale. No. 3, a brick-red calcareous clay in a finely divided condition. No. 4, a mixture of light-blue argillaceous limestone and red clay, pieces of soft white sandstone, and aggregations of small cubical crystals of pyrite. Among the washed material are some fragments of a hard, grey, even-grained limestone, large and small rounded grains of clear quartz, a fragment of whitish limestone very like the harder portion of the limestone at Grand Rapids near the mouth of the Saskatchewan river. No. 5, very similar to No. 3, but lighter in colour and not calcareous. No. 6, a mixture of red and blue clay, through which are scattered many little fragments of a hard, compact, light bluish-grey dolomitic limestone, a yellowish-white limestone containing a great number of grains of clear quartz sand, aggregations of grains of sand and crystals of pyrite, large but well-rounded grains of clear quartz, and a fine white and buff, well-rounded quartz sand.

No. 32.—A specimen labelled between 500 and 550 feet probably comes from this band. It is a soft, white, porous and apparently massive limestone, in which are a great number of small, flattened, sharply cut rectangular cavities, that have evidently been occupied by crystals of chloride of sodium. This rock contains no traces of organic remains, but small, clear crystals of quartz are quite plentiful.

No. 33.—This band is simply a downward continuation of the others, and several specimens were collected from it having the following characters:

505 feet.—A mixture of red and grey, very slightly calcareous clay, with some small fragments of light brown sandstone.

509 feet.—Similar clay, with fragments of limestone like No. 31. Also a whitish limestone, in which are fragments of cylindrical fossils like Coleolus, a fragment of a small shell like Pterinea, with other indistinguishable fragments of shells.

514 feet.—A mixture of light grey and red sandy clay, effervescing freely in H.Cl. Otherwise much like the last.

515 feet.—Similar clay, with fragments of light grey sandstone and aggregations of small crystals of pyrite.

518 feet.—Very similar to the last.

523 feet.—A mixture of red and light greenish-grey calcareous clay. When washed this leaves a residue of light red, fine-grained sandstone, with a few fragments of a white sandstone, whitish, sandy limestone and crystals of pyrite. Also a number of well preserved fragments of shells, among which Mr. Whiteaves recognizes a species of Chonetes, with which are associated numbers of fragments of Coleolus? and beautifully preserved segments of the arms of Crinoids. One of these latter is somewhat similar to the axillary radial of Bathycrinus shown on Plate VII a, fig. 17, Report on Crinoidæ, by P. H. Carpenter, Challenger Report, vol. xi.

525 feet.—A mixture of reddish and light grey shale, and a soft, light greenish-grey, fine-grained sandstone, with a light brown calcareous sandstone, and a vesicular, light grey, dolomitic limestone.

527 feet.—Composed almost entirely of a soft, red, calcareous clay. The washed material consisted of one moderate sized fragment of light grey dolomitic limestone and a few grains of quartz sand.

One specimen of similar clay, etc., from between 500 and 600 feet, but the exact depth of which is not stated, contains a well-preserved fragment of the shell of Chonetes, showing three of the cardinal spines. A specimen marked 590-600 feet is a mixture of red and greenish-grey shale and a light brownish compound of clay and sand. When washed a large portion of the bulk of the specimen is decanted off as fine clay, etc., held readily in suspension by the water, while the coarse residue is composed of some white sandstone, occasionally coloured to a dark grey, a light grey, visicular, sandy limestone, a soft, reddish-brown, calcareous argillite, and a few coarse grains of clear quartz. Also segments of small circular or pentagonal stems of crinoids, pieces of the shell of Coleolus? and a large number of fragments of other shells, some probably Chonetes, while other and larger specimens, with a finely striated sculpture, would appear to belong to the genus Pterinea.

The boring was discontinued at a depth of 600 feet, there being no prospect of obtaining a supply of fresh water at a greater depth.

The exact taxonomic position of the last 188 feet of shales, limestones and sandstones is rather difficult to determine; first, on account of the imperfections of the well record; secondly, on account of the paucity of the organic remains obtained, and, thirdly, on account of our as yet incomplete knowledge of the Palæozoic section in Manitoba.

The Niagara formation, where known just beyond the northern limit of the province of Manitoba, consists of detrital limestones comparatively poor in fossils, overlain by dolomites, both open-grained and compact, in which fossils are only occasionally and locally found, and all are in the form of casts, the true shell not being preserved. Over these is a gap of more or less uncertain thickness, possibly a hundred feet or more, which would seem to consist of shales or other soft rocks, the top bed being known to be a red shale. These shales, etc., doubtless form the base of the Devonian. They are overlain by the Middle Devonian dolomites, and these again by the shales and limestones of the Upper Devonian.

Turning now to the consideration of the fossils found in the drillings, the fragments of crinoids and the Pterinea? are of but little service in the determination of the horizon of the beds. The Coleolus? is very like a form that is common in the Stringocephalus zone at various exposures on the shores of Lakes Manitoba and Winnipegosis, and would thus indicate to some extent a Devonian horizon. The fragments of Chonetes are too imperfect to allow of the specific identification of the species, but as in several specimens the hinge-line is preserved they leave no doubt as to the genus. This genus in America ranges from the Clinton, or base of the Niagara, to the Carboniferous, but is most common in the Devonian. In Manitoba two species are locally abundant in the shales and argillaceous limestones of this latter system, while none have been found in the Silurian. This also points strongly to the Devonian age of the red and grey shales at Morden, and makes it quite certain that they are not older than the Niagara. As far as is known, however, the Niagara formation consists entirely of light grey limestones and dolomites, without any sign of red or grey shales, and unless the character of the rock changes very greatly as it is followed from north to south, the shales penetrated in the Morden well would not belong to this formation.

It remains therefore to consider the Devonian affinities of the beds in question. From the well at Rosenfeld, twenty-four miles east of Morden, Dr Dawson has recorded a thickness of 352 feet of red and grey shales, etc, at the top of the Palæozoic section, but from these drillings no determinable fossils were obtained. Below these shales no dolomites were met with, and no rocks that could be supposed to represent the Middle Devonian dolomites. The shales from the Morden well appear to represent a portion of this Rosenfeld series, and the absence of the Stringocephalus zone seems to indicate that these beds represent a lower horizon. The inference is therefore very strong that they lie below the Stringocephalus zone, and represent the basal shales of the Devonian, which have been eroded away and have left no salient exposures in the lacustral area to the north. It has been seen, too, that in the lacustral area the strike of the contact of the Devonian and Silurian runs in a fairly straight line N. 25° W., and this line being extended from the southeast angle of Lake Manitoba, would cross the international boundary line a few miles west of the Red river. A south-westerly dip from this line at a hypothetical elevation of 810 feet, the elevation of Lake Manitoba, at the rate of 10 feet to the mile, probably about the true dip of the beds here, will bring the top of the Silurian 300 feet above the sea at Morden, or 75 feet below the present bottom of the well.

Boring on Vermilion River.

This boring was sunk by the Manitoba Oil Company on the west bank of the Vermilion River, a short distance below the crossing of the Strathclair and Lake Dauphin trail, in township 23, range 20, west of the principal meridian.

In the spring of 1887 a percussion drill was hauled north from Strathclair station, on the Manitoba and Northwestern Railway, and the well was drilled to a depth of 292 feet, when an accident happened to the machinery which delayed the work for a time.

In the following year the drill was moved a short distance farther down the valley, work was resumed, and a final depth of 743 feet was reached.

From a comparison of the sections, the second well is found to have been begun nine feet lower, geologically, than the first, and therefore the levels of all the specimens

obtained from it have been corrected by the uniform subtraction of nine feet, in order to give them their proper position in the total section.

For the log of this well, with illustrative specimens, I am indebted to the kindness of W. R. Baker, Esq., Superintendent of the Manitoba and Northwestern Railway, who was one of those most deeply interested in the success of the well.

The record as given below is compiled from the log kept by the driller and the results of my examination of the specimens.

Height of Surface at Boring above Sea, 1300 Feet.					
No.	Description of Material passed through.	Thickness of layer in feet.	Depth of bottom of layer from surface.	Height above sea.	FORMATION.
1	Soft, dark gray clay shale.....	95	95	1205	Pierre (Millwood Series).
2	Fragmental limestone.....	4	99	1201	Niobrara.
3	Grey calcareous shale	124	223	1077	
4	Dark grey fissile shale.....	178	401	899	Benton.
5	Coarse sandstone, with pyrites....	19	420	880	Dakota.
6	Compact white limestone.....	120	540	760	Devonian.
7	Blue-grey clay shale.....	10	550	750	
8	White gypsum.....	15	565	735	
9	Red shale.....	110	675	625	
10	Shale and limestone.....	68	743	557	
11	Red shale	At	bottom.		

No. 1.—Specimens from 30, 48 and 91 feet show this to be a soft, dark grey, non-calcareous clay shale belonging to the Millwood series of the Pierre shales, similar to that seen in the naked and almost vertical cliffs washed by the river a few hundred yards above the trail crossing.

No. 2.—This is a hard band that was spoken of as "sandstone" by the driller. It consists almost entirely of fragments of the prisms of the shells of a large Inoceramus, mixed with fragments of *Ostrea congesta?* This evidently represents the band of sandstone-like limestone that outcrops on the Assiniboine river below the mouth of Cypress Creek, and is also seen at several places along the eastern face of the Riding Mountain. It lies at the top of the Niobrara formation.

No. 3.—Specimens collected from 146 and 164 feet shew this to be a mottled, blue-grey, calcareous clay shale or marl. Under the microscope it is found to be mixed with prisms of the shells of Inoceramus, fragments of the shells of *Ostrea congesta?*, minute portions of fish skeletons and quite a large number of foraminifera. These comprise such forms as *Globigerina cretacea* and several species of Textularia, and with them are associated many Coccoliths and Rhabdoliths. These evidently represent the characteristic shales and marls of the Niobrara formation.

No. 4.—Specimens obtained from 213–247 feet consist of a dark blue-grey, fine-grained, unctuous, non-calcareous clay shale, breaking down into thin flakes. These represent the typical Benton shales.

No. 5.—A specimen from 411 feet consists of grains, varying greatly in size, of clear, white quartz. Some of these grains are quite angular in shape, and many are stained on the outside with iron. With the sand grains are mixed small cubical crystals of pyrite. In a paper published in 'The American Journal of Science' for September, 1890, the writer gave the Dakota formation in this well a thickness of 55 feet, but he has since found reason to believe that a specimen of sandstone labelled 369 feet is not to be depended on, and the record has therefore been altered as above to agree with the log kept by the driller, thus reducing the thickness of the Dakota to 19 feet.

No. 6.—A specimen from 509 feet is a moderately hard, fine and even-grained, light grey limestone, through which are scattered small subangular grains of colourless quartz and grains of pyrite. A specimen marked 510-540 feet consists of similar limestone, with fragments of light and dark grey clay shale.

No. 7.—A specimen from the lower part of the band consists of a mixture of light blue-grey clay shale, particles of limestone, some few crystals of colourless quartz, and particles of opaque white gypsum from the top of the band below.

No. 8.—A specimen marked 550–565 feet is made up largely of fragments of opaque white gypsum, mixed with a few fragments of limestone, crystals and fragments of colourless quartz, and small nodular masses of pyrite.

No. 9.—A specimen marked 565–645 feet consists of a soft, light brownish-red, fine-grained shale, mixed with fragments of light grey shale and particles of limestone. In the clayey mass are also many minute and very perfect crystals, as well as irregular particles of clear transparent quartz.

No. 10.—A specimen from 718 feet consists of a light pink, hard, compact, fine-grained limestone that effervesces strongly in H.Cl., leaving a similarly coloured fine clayey precipitate. With the limestones are many fragments of a fine-grained, white sandstone, and a very few white, opaque particles of gypsum. A specimen from 740 feet is a mixture of fragments of cream-coloured limestone and reddish shale. It effervesces strongly in H.Cl., leaving a residue of dark grey and buff-coloured shale, fine grains of quartz and small particles of pyrite.

No fossils have been obtained from the palæozoic rocks drilled through in this well, and in the absence of direct stratigraphical correlation their exact age cannot at present be determined. However, their geographical position clearly shews that they are of post-silurian age, and the absence of dolomites excludes them from the middle or Winnipegosan formation of the Devonian. It is also altogether unlikely that fossils would have been so uniformly absent from the drillings if some of the lower highly fossiliferous beds of the Manitoban formation or Upper Devonian had been passed through. Many of the limestone fragments from near the bottom of the bore correspond closely with the limestone outcropping near the mouth of Mossy River, at Point Wilkins, etc., belonging to the higher portions of the Manitoban formation exposed in natural sections, and the known southwesterly dip of a few feet to the mile would account for the difference in elevation of the beds.

It is therefore probable that the palæozoic beds passed through in the Vermilion River boring represent an upward continuation of the Point Wilkins limestones, and therefore in the main overlie the highest Devonian beds seen on the shores of Swan Lake or Lake Winnipegosis.

IX.—*On the Geology of Part of the Province of Quebec, South of the St. Lawrence.*

By R. W. ELLS, LL.D., F.G.S.A.

(Presented by Mr. J. F. Whiteaves, F.G.S.)

(Read May 27, 1891.)

The discussion of the problems presented in the study of the rock formations, found in the province of Quebec, south of the St. Lawrence, has been carried on with considerable persistence for the last forty years. During this time the views of the different observers, as presented in the several reports of the Geological Survey of Canada and in other scientific publications have become almost classical in Canadian geology. It would indeed be strange if, in all this long period, there should be no divergence of views as to the age and relative positions of the different series of rocks then found. In fact we could scarcely expect anything else than that, in the great growth of geological knowledge within this period, such change of views should occur.

The history of the various opinions held by the different writers on this subject has been stated with more or less completeness by several writers.[1] There is none however yet published which presents a complete statement of the latest views on the subject, or the conclusions now held by those who have most recently worked out and mapped the geology of the district. The latest publication on the geology of the Gaspé peninsula is found in the report of the Geological Survey for 1882, in which, however, the views of structure now held, though briefly suggested, were not clearly enunciated. Sundry other papers on portions of the district have, however, since that date appeared, among which may be mentioned one by Sir Wm. Dawson on the sponges of Métis, and also a paper by Prof. Chas. Lapworth on the paleontology and geological sequence of the several divisions of the Quebec group, published in the 'Transactions of the Royal Society of Canada,' 1886. This, while giving much information as to the horizon of many of the fossils there found, and the relative positions of the several members of the group as well as of the overlying and underlying formations, is also manifestly incomplete; inasmuch as the true order of succession had not then been fully ascertained, and also from the fact that the supply of material upon which the conclusions there stated were based was insufficient and incomplete. To those who have not therefore studied the subject of the Quebec group in all its bearings, and according to the latest developments of the question, this paper of Lapworth's presents some points not wholly clear. Since its publication, however, much additional evidence has been obtained, both from the large and carefully arranged collection of fossils and from the working out of the stratigraphy over a very

[1] T. Sterry Hunt, see. 'Geol. Survey,' Penn., 1878; Jules Marcou, 'The Taconic System,' 1885; Jules Marcou, 'Canad. Geol. Classification,' 1889; R. W. Ells,' 3rd An. Rep. Geol. Survey' Can., vol. iii, k.

wide area. And it is with the hope that some of the puzzling questions in connection with the peculiar series of rocks known as the "Quebec group" may be simplified, that the evidence to hand and the conclusions as to its structure now arrived at are here put forth, for there is no doubt that the conflict of opinion which has prevailed concerning this group of strata, and the apparent mistiness which has attended their study during the past twenty years has had the effect of discouraging investigation in this direction, except in the case of those persons directly interested in the subject.

Prior to 1860, it was held by Canadian geologists that the greater part of the rock formations east of the St. Lawrence and extending to the boundaries of Maine, New Hampshire and Vermont, were of the age of what was then regarded as the Hudson River division of the New York geologists, with the exception of certain areas towards the eastern border, which were regarded as upper Silurian or Devonian, and certain other portions in the vicinity of, and to the south of, Montreal which were assigned to their proper places in the geological scale as the equivalents of the Potsdam, Calciferous, Chazy and Trenton.

The rocks of this great area east of the St. Lawrence, presenting a breadth of more than 120 miles east of Montreal and a length from the Vermont boundary to the extremity of Gaspé peninsula of about 475 miles, exhibit a very great diversity of character. Thus, a large portion are fossiliferous, while other great areas are highly crystalline and show no traces of the remains of organic life. Other great areas of slates and hard sandstones have also not yet disclosed any fossil evidence by which their age can be fixed, but are clearly a distinct series of rocks from the fossiliferous sediments on the one hand and the crystalline schists on the other. In structure and general arrangement, it may be said these latter constitute a series of anticlinal ridges, generally prominent and easily recognized, which extend parallel to the course of the St. Lawrence at a considerable distance inland.

The structure of the several formations here found is complicated by the presence of numerous great faults, and by a wonderful series of crumplings, foldings and frequent overturns, which have so changed the natural order of deposition as to present one of the most complicated pieces of geological arrangement to be found anywhere on this continent. Thus, in places, fossiliferous beds of the Trenton or Hudson River formations are found in contact with, and in apparently conformable sequence beneath, recognized strata of Cambrian age; while, in other places, the Silurian and Devonian sediments are so intimately infolded with Cambrian and Cambro-Silurian rocks as for many years to cause them to be regarded as integral portions of the same formation.

The Hudson River or Utica age of the rocks in the vicinity of the St. Lawrence, south of Quebec, both on the north and south side of the river, was one of the first points accurately determined in the geological structure of the province of Quebec.[1] These contain an abundance of characteristic fossils in an excellent state of preservation, and present no difficulty from the paleontological standpoint. Where these Hudson River rocks cross the St. Lawrence from north to south, about ten miles south of the city of Quebec they dip directly beneath a great series of red, green and black shales, with hard sandstones, which can thence be crossed for many miles in a south-east direction and which would therefore appear to form an upper portion of the Hudson River series, and this was the view maintained by geologists generally for some years. The fact that

[1] Rep. Geol. Survey, Logan, 1847-48.

the rocks of the overlying and apparently newer series either contained no fossils such as might at that time determine their true age, or yielded a series of peculiar forms, principally of graptolites whose exact position in the geological scale was so undeterminable as to render them of comparatively little value in fixing accurate horizons, tended still more to confuse the question.

Acting then upon the supposed stratigraphical sequence of formations, the rocks east of the St. Lawrence were held to form a gradually ascending series from the Hudson River to the Devonian, the fossiliferous strata of the latter, along with the Upper Silurian, being found at several points far inland, resting upon the beds which were held to overlie in regular sequence the Hudson River formation, and thus the structure, had it not been complicated by faults and overturns whose importance was not at that time recognized, was an apparently simple one. At many points the superposition of the red and green slate series was evident enough, not only near the city of Quebec, but hundreds of miles to the east, where, on the north side of the peninsula of Gaspé, for a long distance, the relative positions of the two series as just stated were easily seen both along the beach and a short distance inland, while to the south, towards the Vermont boundary, a like structure and succession was disclosed.

The rocks of the central mountainous area of Quebec, which in part constitute the extension into Canada of the Green Mountain range of Vermont, presented great difficulties. Their position was not clear at that time or for many years after. In some places these consisted of greenish, greyish and black stratified rocks, occasionally with purple-tinted beds and with bands of sandstone and great areas of quartzite and dioritic rocks. In colour these resembled somewhat the beds near the St. Lawrence, but in texture they differed widely, being for the most part highly schistose and metamorphic, containing very often mica, talc or chlorite, while some of the heavy masses of diorite presented in the field a very strong resemblance to a highly altered quartzose sandstone. The inference was adopted therefrom in the earliest stage of the study of this section that these rocks were not only metamorphic, but that they were the altered equivalents of the fossiliferous Hudson River series, or directly succeeding sediments of the St. Lawrence area, and that the metamorphism was due to the great changes which had taken place during the period of mountain-making. This view, adopted by the Canadian geologists, was practically that accepted by most geologists in the United States, where the extension of these rocks had been studied in Vermont and western Massachusetts, and thus down to the year 1860 the view was general that all these highly crystalline rocks were of Upper Hudson River age, the fossiliferous character of which had been completely obliterated by the great amount of metamorphism to which they had been subjected.

But this view of the structure and age of this great series was shortly to be largely modified. In 1857-58 certain beds of slates and limestone, with masses of limestone conglomerates, which were developed in the town of Lévis, opposite Quebec, were more carefully examined by the officers of the Geological Survey. They were found to be wonderfully rich in fossil remains, not only of the graptolites which had already been obtained and examined by Prof. Jas. Hall, but of other forms as well, including brachiopods, trilobites, cephalapods, etc., of which a very large collection was obtained. These were carefully examined by the late Mr. E. Billings, and among them were found many forms which clearly indicated that the containing beds belonged to a much lower horizon

than the Hudson River formation, although they were from rocks apparently superimposed. As a consequence of this, the stratigraphical sequence was again studied and the whole area mapped in detail, the result of which was to locate a fault and overthrust, by which the fossiliferous strata of Lévis were shoved up by a south-easterly force upon the fossiliferous beds of the Hudson River and Trenton, which latter rested upon the fundamental gneiss of the Laurentian, as seen on the north side of the river at Montmorency and at other points both to the east and west, and that the whole Lévis fossiliferous series was thrown into a great succession of folds. The change of opinion rendered necessary by the recent discoveries was speedily announced, and the rocks of the Lévis shore, including the limestones, conglomerates and associated graptolitic slates, together with the red and green shale and sandstone series, were transferred from the top of the Hudson River formation to the base of the Lower Silurian, or the horizon of the Calciferous-Chazy.

The original view, however, according to which the crystalline rocks of the mountain ranges of the interior were held to be the altered equivalents of those near the river was maintained, though these were now regarded as the equivalents of the altered Calciferous-Chazy rather than of the Hudson River portions of the series; and to the portion which had now been separated from the general Hudson River formation Logan gave the name of "Quebec Group," which name has been retained to the present day. This was in 1861. This group was divided into two parts, viz., the Lévis and the Sillery, the former comprising the highly fossiliferous slates and conglomerates of Point Lévis, whence the name, while the latter was held to embrace the red and green slates and sandstones which, from being well exposed at the village of Sillery, about three miles south of Quebec, was given the name of that locality. A third division, supposed to be intermediate in position between these and comprising the red and green shales, with certain other beds of the Lévis formation, well seen in the seigniory of Lauzon, south of Point Lévis, was established and styled Lauzon from the place where first carefully studied. This was first described in the report for 1866. The details of these several divisions will be found stated at length in the 'Geology of Canada,' 1863, and in the report just mentioned, and it is unnecessary to repeat them here. The order of sequence was supposed to be upward from the Lévis, through the Lauzon, into the Sillery, which was regarded for the time being, though this was not clearly established, to constitute the upper member of the group. Of these three divisions the Lévis, as already stated, was highly fossiliferous; the Lauzon was characterized by the presence of three known species, viz., two lingulæ and an obolella, while the Sillery, which was regarded as composed principally of the heavy green-grey sandstones, was not known to be fossiliferous at all. All these formations were regarded as newer than the Potsdam.

In 1868-69, however, Mr. James Richardson made a somewhat detailed examination of the formations along the south side of the St. Lawrence, from the Chaudière River to Rivière du Loup, and came to the conclusion that certain portions, more particularly including the large areas of whitish quartzose sandstone and associated limestone conglomerate, should be separated from the position they had so long held and assigned to a lower horizon. He therefore described these portions as belonging to the Potsdam formation, and divided them into upper, middle and lower. The cause of the separation was the finding of certain somewhat obscure fossils of supposed primordial age, among

which are a Salterella in the limestone, and a sponge, Archeocyathus, in the slates. The associated strata, however, were similar to what were observed in connection with the other masses of Sillery sandstone, and upon subsequent careful examination of the evidence by Sir Wm. Logan and later by Dr. Selwyn the reasons for their separation from the rest of the Sillery were not considered sufficient to warrant such a step.

About this time also, (1869), renewed attention was directed to the crystalline rocks of the interior or Sutton Mountain range, and a more detailed examination of these was begun by Dr. T. Sterry Hunt. Their resemblance to the copper bearing rocks of Lake Superior had already been pointed out by Logan, Macfarlane and others, in various papers and reports, but no views dissenting from the opinion that these were the equivalents of the fossiliferous Quebec group had been expressed. In 1865, however, Mr. G. F. Matthew expressed his views that the cupriferous schists of Southern New Brunswick, there recognized as pre-Cambrian, were similar to those of Eastern Quebec,[1] and in 1870 Dr. Hunt published the opinion in the 'Proceedings of the Natural History Society of Boston' that the Green Mountain rocks, which extend into Canada and form the Sutton Mountain range, were of the same age as the pre-Cambrian of New Brunswick and other areas in the Eastern States, supplementing this view in the following year by the statement that their age was Huronian.[2] This view did not, however, at the time meet with the approval of the Canadian geologists; who continued to hold to the opinion already expressed concerning the age and metamorphism of the rocks in question, but the investigations by Dr. Selwyn in 1876-77 caused him to come to a conclusion very largely in accordance with that already expressed by Dr. Hunt.[3] Subsequent work upon these rocks by Prof. C. D. Walcott and others, including the writer, has shewn them to underlie fossiliferous strata of lower Cambrian age, so that the controversy so long maintained as to the true position of the greater part of these crystalline schists and associated rocks may be now regarded as practically ended. They have in accordance with this view been carefully studied in connection with the distribution of the newer and fossiliferous sediments, and their areas have been mapped by the officers of the Geological Survey.

Returning to the question of the fossiliferous Quebec group it must be mentioned that the order of sequence adopted in 1863 for the three divisions, the Lévis, Lauzon and Sillery, was rather for the purpose of facilitating the mapping than of asserting this as their true relative positions. Indeed certain points, both in regard to the fossil evidence and the stratigraphy, went strongly to show that the Sillery shales and sandstones might very properly be regarded as the lowest member of the group; and in Dr. Hunt's report to the Second Geological Survey of Pennsylvania, 1878, p. 117 E, the order of sequence of the fossiliferous rocks of the Quebec group is: 1st. Sillery sandstones at the base; 2nd, the trilobitic beds of Lévis and Philipsburg; 3rd, the phyllograptus shales of Quebec, and 4th, the black shales of Farnham.

Before entering upon the discussion of the accuracy of this grouping, it may perhaps be useful, for the sake of greater clearness, to give a brief sketch of the views held from 1863-69, more particularly in regard to the structure as seen in the southern part of the

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[1] Geo. F. Matthew, 1865, Geol. of South N. B., Cuprif. rocks of S. E. New Brunswick compared with those of the E. T. of Quebec, Canada.

[2] Am. Jour. of Science, 1871, vol. iii, I, p. 84.

[3] Rep. Prog. 1877-78, p. 14 A.

province, on the Vermont boundary, where the equivalent of the Lévis formation had been recognized.

The rocks of the section between Philipsburg (on Missisquoi Bay, the lower north-east extremity of Lake Champlain) and St. Armand station, on the line of the Central Vermont railway, consist largely of limestones of various shades of gray with partings of shales. The limestone is in places crystalline and on the eastern portion of the section nearer St. Armand, a well defined synclinal is seen in which beds of dolomitic greyish shales occur. The greater part of the series throughout the section is fossiliferous, and in places fine specimens can be obtained, not only from the weathered surface of the rock, but from the mass itself, although the breaking out is sometimes difficult. The fossils obtained are characteristic of the Calciferous and Chazy formations, the latter being abundant in the upper beds, and there is a regular passage apparently from the lower to the higher. Further to the north-east, about Bedford and Mystic, in Stanbridge township, there occur in connection with the upper portion of the section, beds of conglomerate as well, the pebbles, consisting of limestones in a calcareous matrix. The fossils furnished are also of Chazy age, while many of the pebbles contain fossils also of Calciferous age and of a character such as show that they have been derived from the rocks of the Philipsburg section. Large collections of these fossils were examined by Billings and compared with those from the Lévis beds, and the similarity was found to be so great that the three horizons were regarded as practically identical.[1] The conglomerates of Stanbridge, however, which yielded Chazy forms from the paste, were held to be newer than the Lévis rock, as none of the species which characterize Div. C., which may be said to be the lowest member of the Chazy formation in the Philipsburg section, were recognized in the Lévis conglomerates. If now we continue the line of section eastward from St. Armand station we find, after passing a river flat, a ridge of hard dolomitic and silicious rocks, sandstones and slates, sometimes reddish, but more frequently of a greyish colour, which contain fossils of primordial age and which were assigned by Billings to the Potsdam formation. This represents the red sandstone of Vermont and has more recently been examined by Walcott, who had found lower Cambrian fossils at various points of the series. The term Potsdam, as used by Billings, should not, however, be regarded in the limited sense in which it is applied at the present day, since the term was then held to include all between the Calciferous and the Huronian.

Passing the outcrop of these Cambrian rocks, which is of no great width, we reach at once a series of bluish-grey calcareous and dolomitic slates which extend thence eastward to within two miles of Frelighsburg, where they are underlaid by other slates, hard, greyish and siliceous, along with black slates and hard dolomitic beds, the latter also siliceous and veined with white quartz, which constitute a well defined feature for many miles. In the adjoining state of Vermont, near Highgate Falls, Walcott has found upper Cambrian fossils, not only in the black slates associated with the dolomite bands, but in certain associated beds of limestone breccia, thus definitely fixing the horizon of the whole series, while from the area of dolomitic grey slates, which comes between these and the Cambrian axis near St. Armand, Chazy fossils have also been obtained. Thus we have four well defined horizons in this section of fossiliferous rock, all of which can be readily distinguished and mapped, ranging from the base of the Cambrian to the top of the Chazy.

[1] 'Geol. of Canada,' 1863, p. 860.

The upper part of the section is furnished by a belt of black shales and limestones often graphitic, which are found at Farnham West and Centre, and which contains graptolites and other forms which indicate a Trenton horizon.

This last series of Farnham is worthy of a brief description, since upon these or their equivalents elsewhere, much of the confusion regarding the stratigraphy of the Quebec group depended. From Farnham Centre they can be traced northward continuously for many miles and are there found to be the equivalents of the black graphitic slates and limestones of Richmond, Melbourne, Danville, Arthabaska, etc. The structure of this division at Richmond and Melbourne is much more obscure than at Farnham, though recent researches have shewn these also to be fossiliferous and to be of Trenton age; but at Melbourne and Danville, several heavy faults and probably overthrusts have brought the limestone into an apparently underlying position to the crystalline schists and other rocks formerly regarded as the Sillery division of the Quebec group. They here have the structure of an anticlinal and were for many years regarded as the lowest members of that group, although the contained fossils in the beds at Farnham, seemed to be opposed to this view.[1] The occurrence of these limestones further to the north, near Arthabaska, in their proper position, resting upon the crystalline schists on the one hand and, upon the Sillery red and green shales on the other, showed that these must be considered newer, especially when, from the same black beds, characteristic Trenton fossils were obtained. This view, which was expressed in 1877 by Dr. Selwyn, has since been amply confirmed by the writer, not only for the district north of Richmond but in that of Farnham, where the regular stratigraphical position of these limestones and shales as the upper members of the Chazy Trenton formation is clearly established.

The stratigraphy of the Lévis beds was rendered still more confused by the fact that of the large collections of fossils which were obtained in 1857-60, part were taken from the pebbles of the conglomerates and part from the paste, the separation of which was not carefully attended to, while a further element of confusion resulted from the obtaining of a great number from a large but loose boulder of conglomerate, supposed at the time to be from one of the conglomerate ridges of the vicinity, but which may have been derived from belts of an entirely distinct horizon at no great distance. Hence the inevitable result followed of a commingling of forms of Potsdam and Calciferous ages apparently from the same formation. The faulted and overturned condition of the strata from which the fossils were obtained, and the consequent uncertainty of the true relation of the several divisions rendered the question still more complicated.

A comparison of the Lévis rocks with those of the north extremity of Newfoundland, while serving to show that these there occur, in character precisely similar to what is seen in the province of Quebec, is of very little assistance in the matter of understanding the complicated structure of the group. It is evident from the sections furnished of that locality that the same errors of stratigraphy affect their value unfavourably, which for many years rendered the structure nearer home unintelligible. It is believed, however, that a careful reexamination of the Newfoundland sections, in view of the new light obtained as to the structure of the group, would be of great value in completing the portions of the sequence upward from the Laurentian, which have been apparently faulted out in the sections presented along the River St. Lawrence.

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[1] 'Geol. Can.' 1863, pp. 239-40.

In addition to the division of the Quebec group found at Lévis, there was included in the Lévis formation the rocks of the citadel and city of Quebec, which for many years were regarded as non-fossiliferous. Examination of these by Dr. Selwyn in 1877 led to their removal from this formation to a higher position in the scale. Subsequently fossils were found at different points in the city rocks by Mr. T. C. Weston and later by other members of the Geological Survey staff, which have been partially determined and from which a difference of view has arisen concerning their exact horizon. As this question cannot yet be considered to be fully settled, pending further investigation, discussion of the question may be considered unnecessary. But they appear to belong to what Billings calls the Trenton division of fossiliferous rocks, which by him were regarded as including the Black River to the Hudson River formations, both inclusive.

The question of the age of the Quebec group rocks passed almost entirely out of the field of public discussion after Richardson's report of 1869, for some years the only official reference to the subject being the important paper by Dr. Selwyn in the report of 1877-78, which was reproduced in enlarged form in the 'Transactions of the Royal Society of Canada,' 1882, in which he summed up concisely the changes of opinion arrived at after his study of the Eastern Township geology for several years prior to that date. In this paper, the first official separation on the part of the Geological Survey of the crystalline schists from the fossiliferous portion of the Quebec group, and their probable equivalency to the Huronian of other parts of Canada, was made. The evidence for dividing the Sillery into two portions, as suggested by Richardson, was not considered sufficient, but a lower Cambrian series was suggested, which might embrace a great group of rocks beneath the Sillery and Lévis as hitherto recognized, while the Sillery and Lévis were classed together under the head of Lower Silurian. In the paper to the Royal Society of Canada, 1882, the division into pre-Cambrian, Cambrian and Cambro-Silurian was clearly asserted; and in regard to the fossiliferous portion, viz., those rocks seen about Quebec, Lévis and the south side of the St. Lawrence, the statement is made that the Sillery and Lauzon divisions, embracing the red and green slates and sandstone, undoubtedly underlie the more highly fossiliferous Lévis portion, thus overturning the order of stratigraphy which had been maintained since 1863, and confirming the statements of Dr. Hunt in 1878 already quoted.

During the seasons of 1882-83 the examination and mapping of the rocks on the Gaspé peninsula was taken up by the writer. In this work sections were made not only along the whole extent of both north and south coasts, but along the rivers from side to side. On the south coast, rocks of the lower Sillery division of the Quebec group and of the metamorphic portions were found extending for a short distance west of Cape Maquereau, eastward for some miles. Those more directly of Sillery aspect consisted of purple, green and grey slates, often argillaceous in texture, considerably altered, and having sometimes a schistose structure and with numerous quartz veins. They more closely resemble the lower portions of the Sillery, and these were underlaid near Cape Maquereau by schists of various kinds, including talcose, chloritic and micaceous, along with certain felspathic rocks, which were regarded as of pre-Cambrian age. The age of the overlying series was at that time stated as probably Cambro-Silurian, following the determinations of previous years, which held the Quebec group to be the equivalents of the Calciferous-Chazy, and on the hypothesis that the Sillery was more recent than the

Lévis, the information then at hand not being sufficient to state with positiveness that the Sillery did really underlie the Lévis. On the Middle River of Port Daniel also a series of black graptolitic, bituminous shales is seen, resembling in character those of the River St. Lawrence sections at the mouth of the Marsouin and elsewhere. The Lévis shales and conglomerates do not, however, appear in this direction, nor the characteristic green and red slates of the upper Sillery. Their absence is probably due to faults which have affected the strata in this locality, the evidences of which are visible in the broken and occasionally slickensided aspect of the rocks at several points.

In the adjacent province of New Brunswick, extending south-westerly from the mouth of the Tête-à-gauche River, on the Bay of Chaleurs, somewhat similar rocks are found. These consist of black, green, grey and reddish slates, and, near the mouth of the stream mentioned, certain bands of black graphitic slates occur, which contain graptolites resembling in character also those of the Marsouin River. These rocks were described in the report for 1879,[1] and in this report all these rocks will be found discussed under the head of Cambro-Silurian, for the reason already given for the southern Gaspé rocks. The resemblance of certain red and green rocks of northern New Brunswick to the red and green series of Quebec was pointed out in that report and also in 1865 by Prof. Hind,[2] and there is no doubt that certain portions of the Quebec group are there represented, though there is no trace of the fossiliferous Lévis slates and conglomerates visible in any part of that province, in so far as yet ascertained, with the exception of certain bands of black slates recently found by Mr. G. F. Matthew near the St. John suspension bridge, which contain graptolites of precisely similar forms to those found in the rocks of Point Lévis.

The north shore of the peninsula of Gaspé affords exceptionally good facilities for the study of the fossiliferous portion and discloses a magnificent cliff section for quite 350 miles. In this distance the wonderful succession of folds, faults, overturns and crumplings is exhibited, while the facilities for the collection of fossils are exceptionally good. As much misunderstanding appears to exist concerning the character and age of the strata here seen, a brief sketch of the strata as they occur between Cape Rosier and Point Lévis may be here given for the purpose of rendering this part of the subject clearer. The detailed lists of fossils from various points has already appeared.[3]

Beginning near the extremity of the Gaspé peninsula about two miles south of Cape Rosier, the contact between the limestones of the Gaspé Silurian formation and the Quebec group proper is seen, the latter consisting of hard grey slates, with hard calcareous and quartzose bands and with beds of hard quartzose grit, which, in the course of several hundred yards, include finely fissile red slates and hard purple-grey quartzose rocks. These present the same aspect as the beds of the Sillery formation, south of Point Lévis.

Thence to near the extremity of Cape Rosier, where the lighthouse is placed, alternate beds of red, brown, greenish-grey and black slates, with beds of dolomitic limestone and hard green sandstone, occur, the quartzose beds, which are local developments only, being in places well exposed.

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[1] See 'Report of Progress, 1879-80,' p. 23 D.

[2] "Report on the Geology of New Brunswick," H. Y. Hind, 1865.

[3] Rep. 1881-82, Ells, p. 16-31 DD. Lapworth, Trans. Roy. Soc. Can. 1886. Graptolites of the Lower Palæozoic of the St. Lawrence, etc.

Next, before reaching the extremity of the cape, beds of limestone conglomerate, with black and grey slates come in. They form a narrow belt at this place, having a strike coinciding closely with that of the shore line on the north, and they can be traced westward from the extremity of the point for nearly a mile, containing in this distance several bands of limestone associated with the shales. The strata generally are much disturbed and several abrupt folds are visible. At the end of this distance the beds are broken up and a well defined fault is seen, the succeeding rock to the westward being quartzose sandstone, with green and grey shales, which gradually shade off into red and purple beds, similar to those south of Cape Rosier. Thence along the shore westward towards Griffin Cove, red, green and black shales, with bands of sandstone, are seen as far as Marin Brook, half a mile west of which there is a contact on the beach between these and a series of black shales and limestones, which thence can be followed westward for many miles, and which are highly fossiliferous at many points, containing a fauna characteristic of the Trenton-Utica horizon. These are the two series described in the Geology of Canada, 1863; the former under the head of the Quebec group; the latter as the Hudson River or Utica,[1] the latter of which along the contact dips beneath the red and green slate series, which contact must be due to a fault of very considerable extent.

Concerning the age and relative position of the red and green slate series there is now but little room for discussion. They have been clearly shown to underlie the fossiliferous Lévis formation, the contained fossils obtained near Quebec from the shales being *Obolella pretiosa*, or *Lingula*, and sponge spicules, while from the conglomerates associated with these *Olenellus Thompsoni* is obtained. The particulars as to the order of succession of the two divisions will be found in the report for 1888 by the writer.[2]

The rocks near Cape Rosier, some years ago, yielded fossils which were examined by Lapworth and held by him to indicate the lowest fossiliferous zone of the group. Among these were dictyonema sociale, clonograptus, etc., fossils which pertained rather to the Sillery formation than to the Lévis. In 1887, however, Dr. Selwyn and Mr. T. C. Weston succeeded in obtaining from the beds near the lighthouse a number of forms which appear to belong more properly to the Lévis, and there would therefore seem to be an infolded area of Lévis rocks at this point, or else certain portions of the Lévis fauna extend downward into the Sillery. While certain of the Lévis graptolitic forms, such as phyllograptus, are now known to range downward, the probability at Cape Rosier is, as suggested since, like interpolations of newer strata with the older are seen at a number of points westward, as will presently be pointed out.

Of the three formations seen on the north shore of the peninsula, viz., the Sillery, the Lévis and the Trenton-Utica, which we may henceforth consider as their true order of sequence, the former is by far the most prominently developed, and as this section is a somewhat important one some details may here be permitted.

The coast line from Cape Rosier to Marin Brook, about four miles distant, has already been described as occupied, principally, by rocks of the Sillery formation. From this latter place westward to a point one mile west of the mouth of the Marsouin River, a distance in all of ninety miles, the rocks along the shore belong to the Trenton-Utica and, possibly in part, to the Loraine formations. Their greatest width inland is in the valley

[1] Geol. Can. 1863, p. 267-70.

[2] An. Rep. Geol. Survey, Ells, 1888, p. 54-63 K.

of the Magdalen River, where they are exposed for about four miles. Throughout this whole distance, where contacts are observed, they dip beneath the Sillery. The character of the beds composing this part of the shore section varies at different points. Thus for about twelve miles west of Marin Brook the rocks are mostly bituminous or graphitic black limestones and shales, frequently dolomitic, such portions weathering a characteristic rusty brown. In places surfaces are covered with impressions of graptolites, lists of which have been published in the reports referred to, and show that these rocks are of the same age as those of the city of Quebec and the northwest end of the Island of Orleans. One mile and a half west of Little Fox River beds of grey sandstones, separated by bands of black and grey shale, come in. The surface of the sandstones is frequently broken by peculiar knobbed markings, and impressions of brachiopod shells and graptolites are seen. These probably are newer beds than the black limestone first described. They, however, dip at certain points beneath the black beds, showing that the structure of the whole series here is probably an overturned one. And this is apparently the case with the greater part of the entire St. Lawrence River section.

The grey beds predominate to the Magdalen River, above which the black series again occupy the shore for some miles to Gros Mâle Point, where also graptolites like those of Griffin Cove are abundant. The strata are much folded along this part of the coast, and occasionally the knobbed surfaced sandstones come into view. These latter again predominate for the remainder of the section, nearly to the mouth of the Marsouin River, at which place black graphitic shale contains the usual forms of graptolites of the series as found at Orleans Island and elsewhere. For the last half mile above Marsouin the black beds occupy the beach and the red and green Sillery the cliff overlying.

A peculiar band of rock, noted both at Griffin Cove and at Marsouin River, and important inasmuch as its presence aids to determine this formation at many other points, occurs frequently near the contact with the Sillery formation. This is a belt of hard black cherty slates, breaking with a conchoidal fracture, and among other points where these can be observed are Gagnon's Beach, Crane Island, the Etchemin River and the beach above St. Nicholas, in which latter place graptolites of the black limestone series are found in the cherty beds, showing them to be a part of the newer series.

Between Gros Mâle and the Marsouin, the cliffs along the shore are frequently of great height, reaching in some places probably not far from 1000 feet. In the face of these the strata are seen to be twisted and folded in the most marvellous manner, great overturnings and abrupt curves being visible, which at times extend from the beach nearly to the summit and furnish evidence of the tremendous forces to which these sediments have been subjected.

From the contact at the Marsouin River to Ste. Anne des Monts point, which is three miles west of the river of that name, the coast is occupied by strata of the Sillery formation. These are for the most part red, green and black slates, with beds of dolomitic limestones and local developments of greenish-grey grit. The gritty portion is particularly developed about ten miles east of Ste. Anne, and from the peculiar weathering of certain masses on the beach, has received there the name of the 'pillar sandstone.' This rock precisely resembles in character that from the Sillery quarries above Quebec City; and it is here associated with the red and green slates, so that their horizon is readily fixed. From these some years ago Richardson reported the finding of a phyllograptus. In the upper

Sillery, below Quebec, on the Beaumont shore, certain strata interstratified with the red and green slates, also afforded the writer, in 1888, phyllograptus, showing the extension downward of this form at least. In the same formation also, but from a somewhat lower portion, seen at St. Michel de Bellechasse, certain straight graptolites were found in the same year, associated with obolella and fragments of dictyonemas in the associated black shales. In connection with the pillar sandstone of Ste. Anne, thin beds of limestone conglomerates were observed, in which respect they resemble the Sillery of Kamouraska and other points west of River du Loup.

The rocks about Ste. Anne de Monts present certain peculiarities worth considering; for while the great bulk of these, as already stated, are of Sillery age, certain limited areas, apparently closely infolded, as at Cape Rosier, yield Lévis fossils, and other small areas are of the same cherty black character, as beds found in the Trenton Utica and already described. These newer rocks, both the Lévis and the Trenton, are seen on the beach at low water in a small cove about three miles west of the mouth of Ste. Anne River, and the cherty beds are also well observed on a road running inland from a point about three miles east of the river and about one mile from the shore where there is a hill of the hard cherty rocks with dark grey ochrey weathering slates, and which apparently represent the upper division of the coast series.

The Ste. Anne de Monts river, which enters the St. Lawrence at this point, flows northerly after skirting the base of the Shickshock range of mountains, and traverses the intervening strata at nearly right angles to their strike, showing a succession of red, green and black shales with hard sandstones for about ten miles, which is the distance between the coast and the foot of the range. The range itself consists principally of crystalline rocks, chloritic, hornblendic and epidotic, and rises abruptly to a height in some places of 4000 feet above sea level. On the southern side of the range a large development of serpentine rock with diorite is seen, resting against black hornblende schists. These schists undoubtedly belong to a period older than the Sillery, the lower part of which flanks the hills on the north for many miles, while the south side is for the most part overlapped by sedimentary rocks of the upper silurian age. These mountains indicate the eastern extremity of the Sutton mountain range of the Eastern Townships.

The Ste. Anne locality is worthy of mention also from the fact, that this point and the newly discovered area at Cape Rosier represent the only, at present known, places on the whole coast from which fossils of the Lévis formation have yet been obtained east of the typical Lévis beds, opposite the city of Quebec, and from this point westward, till Point Lévis is reached, the careful survey, not only of the entire coast line, but of every line accessible inland to the overlap of the Silurian, has revealed no strata resembling the Lévis, or newer than the Sillery, except certain faulted-in limited areas of the Trenton-Utica, to which reference has already been made. At several points along the coast the Sillery rocks contain fossils. Occasionally these are found in the black and green shales, but more frequently in certain beds of limestone conglomerate, which are associated with hard quartzose sandstones, which, in turn, are interstratified masses in the red and green shale series. When these are well developed they give rise to a rugged surface and several parts of the shore section shows this character well. Among these may be mentioned Les Islets and Grosses Roches, below Matane, where immense ledges of hard quartzose grit and conglomerate jut out into the St. Lawrence, the composition of the latter being

a coarse gritty paste containing pebbles of quartz, hard sandstone and grey limestone. Similar bold coast features are presented at Bic ; and inland a rough belt of country comprising similar rocks extends, with some interruptions, between Kamouraska and St. Thomas. These rocks form a part of the series described as Potsdam by Richardson from the finding of scolithus markings in the quartzite and salterella in the limestone. They are, however, undoubtedly a part of the Sillery formation, in which the coarser beds have a somewhat unusually large development. About two miles below Matane village certain black shales on the beach, also a part of this formation, contains dictyonema in abundance, var. *sociale*, and fragments of small trilobites of primordial aspect. Large collections of these were made first by Mr. Richardson and subsequently by Mr. A. P. Low, of the Geological Survey ; the beds in which they occur are directly beneath the red and green shales, of the Sillery.

At Little Metis, both the quartzose beds with limestone conglomerate are seen along with slates of various colours, the characters similar to those already described. In certain interstratified black bands in the red and green shale series Dr. Harrington, several years ago, found remains of sponges which have been examined and described since by Sir Wm. Dawson.[1] Precisely similar organisms were obtained in 1877 by Mr. T. C. Weston from the typical Sillery rocks near the falls of the Chaudière above Pt. Lévis, where several forms of Obolella also occur. This Obolella or Linnarsonia is also found in the beds at Métis, and is characteristic of the Sillery rocks at many points both along the shore and inland, as in the vicinity of St. Thomas, St. Gervais, &c.[2] The horizon of the Métis beds can therefore be considered as definitely fixed in so far as their relations to the Sillery elsewhere is concerned, from the fossil evidence as well as from the associated shales, but at Little Métis point the typical Sillery standstone comes in and forms an extensive area along the shore for several miles toward the great Métis River. From the relations of the several series of beds here developed it is probable that many of the beds of the formation are in an over-turned position or are arranged in a series of folds, the indications of which are plainly to be seen in the shore section eastward for some miles.

Between Matane and Métis an important area of the Trenton Utica rock is seen at a place called Gagnon's Beach. This area begins at the mouth of the Tartigo River and extends westward for about three miles. In character the strata are like those observed at the Griffin Cove area, viz., black bituminous limestones and slates, with dolomitic bands, and in places these are filled with graptolites similar to these obtained at the city of Quebec and the Marsouin River—lists of which have been already published.[3] The relations of the Trenton beds at this place are as elsewhere described. At either extremity of the band they dip directly beneath the red and grey Sillery slates, the contact being an overthrust fault.

The section south from Little Métis can be well seen on the Intercolonial Railway nearly to the head of Lake Metapedia where the Quebec rocks are overlapped by the upper Silurian fossiliferous limestones. Between the shore and the railway frequent exposures of the typical Sillery strata are seen on either side of the roads, and on the railway itself, the series is essentially the same. Occasionally beds of limestone conglom-

[1] Can. Rec. of Science, 1890.

[2] Annual Rep., 1888, Ells. p. 66-69 K.

[3] See Rep. Prog. 1881-82, Ells, p. 29-30, D.D. Lapworth 'Tran. Roy. Soc. Can.' 1886, p. 178. Near Tartigo River

erate with quartzose sandstone are seen, but nothing which may be classed as Lévis either in character of sediments or contained fossils has been observed in this direction.

Between Métis and Point Lévis the back country is much more easily accessible than is the district farther east. Numerous settlements exist and rock outcrops are frequent. South of River du Loup a good section is afforded along the road to Lake Temiscouata, on which for over forty miles the rocks of the Sillery division of the Quebec group are well seen; the most southerly beds, close to their contact with the Silurian showing *Obolella pretiosa* which was collected by Bailey in 1890, though at the height of land about midway, certain strata which elsewhere in the Eastern Townships we have regarded as constituting the lowest division of the Cambrian are exposed. No strata of the fossiliferous Lévis occur in this direction, and this remark applies to the whole extent of country westward to the Chaudière River with the exception of the typical areas of Lévis shales, limestone and conglomerate seen at St. Joseph de Lévis, the city of Lévis, and the southwest end of the Island of Orleans.

To the south of the Chaudière in the direction of the Vermont boundary, the Sillery red shale and sandstone series can be continually followed for many miles—occasionally bands of Sillery conglomerate occur, and at one place on the south side of the Chaudière, above the village of St. Lambert, a narrow basin of fossiliferous rock contains fossils of Lévis types. It may be here remarked that this is the only outlier of the newer division anywhere observed in this portion of the province. The red Sillery rocks terminate in the township of Farnham at the line of the railway from Farnham to Cowansville, seventeen miles north of the southern boundary of the province, where in certain red beds on the east branch of the Yamaska River, Mr. T. C. Weston some years ago found certain markings resembling Oldhamia.[1] The red beds are here unconformably overlapped by the limestone of the Trenton formation. Directly in the strike of the Farnham-Sillery outcrop, but separated from it by an interval of fourteen miles of Chazy and Trenton strata, the Cambrian belt of St. Armand Corner already described, the extension of the Georgia red sandrock comes in and can be followed into the State of Vermont.

In the Geological Survey of Canada, 1863, page 228, a section of a portion of the Quebec group, seen on the south side of the Island of Orleans, is given. These were supposed at that date to represent the Lévis division only, and their thickness as there displayed was 5,025 feet, all of which was regarded as underlying the Sillery formation. Subsequently a portion of this embracing the green glauconite shales, the hard sandstones and associated conglomerates, with the red and green shales which occupy a large portion of the south shore of the island, the whole estimated at 3,740 feet in thickness, was separated under the title of Lauzon. The remaining portion of 1,283 feet which embraced principally the graptolitic shales, associated dolomites and conglomerates, was left to represent the Lévis formation. Subsequently the Lauzon division was added to the Sillery.

In 1888 a section was made by the writer on the north side of the St. Lawrence from the great fault above Cape Rouge to the fault below Sillery or Point-à-Pizeau, embracing the typical Sillery and the underlying series of beds which was thence continued across the river to include the strata of Point Lévis. This was published in the annual report of that year, and for the purpose of rendering the new views of structure more easily understood may be here repeated; the section is an ascending one throughout.[2]

[1] Lapworth, 1886, 'Trans. Roy. Soc. Can.' p. 180.

[2] Annual Report Geo. Sur., Ells, 1888, p. 63 k.

1. "Black, green and grey shales with heavy bands of hard greyish, sometimes yellowish white quartzose sandstone, which are thickest in the lower portion, and with occasional thin bands of limestone conglomerate, the pebbles of which are generally small and the paste quartzose. The quartzites have occasionally scattered pebbles of limestone.

2. Greenish, greyish and blackish with occasionally dark reddish or purple tinted shales with bands of hard greyish sandstone, generally fine grained, and in thickness from one inch to a foot, the massive quartzites being absent, and many of the greenish layers being covered with fucoidal markings, well seen on the shore above Cape Rouge, and in the cuttings along the road above that village.

3. Bright red shales, often with thin greenish and greyish bands, which in places are calcareous. The rocks on a smoothed surface have a striped red and green aspect; in the upper part occasional beds of a foot or more of hard greenish-grey sandstone occur.

4. Red, greenish-grey and black shales, with interstratified masses, often lenticular, of greenish and greyish sandstone, ranging in thickness from two feet upwards, in which the Sillery quarries are located. This is the typical Sillery sandstone, which ranges from a fine grained homogeneous rock to a fine quartz conglomerate, much of the rock being characterized by the presence of small flaky pieces of shale and scattered small pebbles or large grains of clear quartz, the bands of sandstones being separated by partings of various colored shale. The local and lenticular character of the sandstone is well seen in the Sillery section, some of the heaviest beds inland, thinning out before reaching the shore in either direction. In the upper part at Sillery church, *obolella pretiosa* occurs. From this point an anticlinal crosses the river to Point Lévis and appears in the cliffs at the Victoria Hotel, when the same obolella is found."

This completes the section on the west side of the river, but if we now pass to the east side at Lévis, we can continue it in ascending order from the red beds of No. 4, just described, as follows:

5. The Lévis shales and conglomerates of Lévis city, and the shore and cliff below South Quebec and St. Joseph, and the west end of the Island of Orleans." These rocks occur in synclinals of the Sillery of No. 4. From information obtained from the study of these rocks in other parts of the Eastern Townships, we can complete the Lévis upward, thus:

6. The black and greyish striped or banded shales, seen in the St. Francis River section, between Sherbrooke and Richmond, and for a long distance to the north and south. These graduate downwards into the Chazy, forming, in fact, the upper part of that formation, and upward pass into the black and graphitic shales and limestones of the Arthabaska and Somerset synclinal, as also of Richmond, Melbourne, Farnham, etc. These latter do not appear in the Point Lévis and Quebec section.

7. The black and brownish bituminous shales and limestone of the city of Quebec, Orleans Island, Marsouin shore, etc., which do not appear to differ in any way from the limestone of No. 6, but which graduate upwards into the Utica-Hudson River or Loraine.

The rocks comprised in the preceding section include all those of the section of the Geol. Can. 1863, to the top of Div. 5. Div. 7 was then regarded as the equivalent of the Lévis, though now admitted to be the equivalent of the Marsouin rocks, which were then regarded as Utica-Hudson.

They are all newer than the crystalline schists of the interior, and they do not include the lowest Cambrian rocks, which flank the pre-Cambrian schists, and which comprise the hard green quartz-veined slates and bluish quartzites, with which are serpentines, etc., in certain localities.

Of the divisions of the section just given, Nos. 1 and 2 have, near Quebec, not yet yielded fossils, except in the forms of worm-trails and fucoids, but certain bands of limestone, apparently belonging to No. 2, have, near St. Rochs des Aulnets, yielded small trilobites of the genus Agnostus. In Div. 3, Dictyonema, Obolella, and certain graptolitic forms are found along the Beaumont shore, and on the south side of Orleans Island, along with sponge spicules at several places, while No. 4 also yields Obolella. The conglomerates of Div. 3, yield *Olenellus Thompsoni* and other lower Cambrian forms, which can be readily obtained from the beds on the shore of Orleans Island, two miles east of the south-west point, and the south shore opposite, four miles from Lévis. The pebbles in which these fossils are found, appear to be derived from the rocks of the Georgia series, which comes into Canada near St. Armand, and which has probably been faulted out in the vicinity of Quebec, since, from the limestones and slates of this portion Prof. Walcott has obtained *Olenellus Thompsoni* and other allied forms in abundance, in the adjacent state of Vermont. It is very probable, therefore, from the fact that these pebbles occur in the conglomerates at many points along the St Lawrence, below Quebec, that the Georgia series was at one time well developed throughout this area. The amount of faulting which has occurred in the St. Lawrence break is very irregular, and has in places been of tremendous extent, involving, apparently, much of the lower Cambrian series.

The structure of the Lévis rocks and of the underlying Sillery, as seen in Lévis city, and thence for two miles east, has been carefully worked out. In this distance, no less than five anticlinals in the Sillery are seen, all of which are more or less overturned, the dips being uniformly to the south east. The fossiliferous Lévis shales can be found in each of the synclinals, along with the Lévis conglomerates; and the eastern limit of these is bounded by an overturned area of red shales, which extends thence for miles to the south-east in the direction of St. Henry. The synclinals are depressed to the north-east, and the Lévis beds cease before coming to the line of section extending from Point Lévis (Victoria Hotel) to St. Henry, but widen out rapidly northward, the underlying anticlinals of red shale diminishing in a corresponding degree towards the village of St. Joseph.

The details of these sections will be found stated in the "Ann. Rep. Geol. Sur.," 1888, pp. 49-51 K.

In the earlier years of the history of the Quebec group the question of the structure and relative age of the several belts of conglomerates seen at Lévis, Quebec city and elsewhere was not worked out to a satisfactory conclusion. The difference in the character and apparent age of the organic remains found in the pebbles had been recognized by Billings and others, and the more ancient aspect of those from Bic and other points on the coast had been pointed out as compared with the fauna obtained from the Lévis beds, while the still newer aspect of the fossils from the conglomerates of the city of Quebec had been observed. Nothing official, however, was published on this subject after Richardson's report, 1869. Some years later Dr. Selwyn recognized three zones of these conglomerates, viz, that of the city of Quebec, which was the newest, that of Point Lévis, and that of the Sillery, comprising those of certain parts of the Island of Orleans, Bic and certain

beds below Matane. This classification has, by the study of the last few years, been carefully confirmed, not only by the age of the associated strata in every case, but of the character and horizon of the fossils obtained from the different series, so that there is no doubt that the conglomerates of the Sillery formation contain an older and entirely distinct fauna than the Lévis beds, while those of the city of Quebec are decidedly newer again than the Lévis. The Potsdam fauna of many of the pebbles in the Lévis conglomerates and the Calciferous fauna found in the matrix serves to fix the position of the middle zone with sufficient accuracy, and to furnish us with a reliable basis for other determinations. The only place where the Lévis conglomerates is found, outside of the Lévis rocks themselves, is on the south-west extremity of the Island of Orleans, unless we except the limited bands of Cape Rosier and Ste. Anne des Monts, already referred to. In composition the conglomerate of the Lévis differs greatly from that of the Sillery. Thus the former passes frequently into a massive limestone, and many of the contained boulders are large while others are small and composed also of other previously formed limestone conglomerate, with generally a calcareous paste, though in its lowest part this becomes somewhat siliceous.

The Sillery conglomerate is generally composed of hard limestone pebbles, with others of hard sandstone and of quartz, the sources of which cannot be ascertained from any beds known at present in the vicinity of the River St. Lawrence where these conglomerates are found. The most probable hypothesis is therefore as suggested that their source is the Georgia sandrock which has been faulted out in this section.

The conglomerates of the Trenton-Utica have as yet been but little studied. Some forms from the pebbles of Mountain Hill in Quebec appear to be Chazy or lower Trenton in character, but these require further examination before their true position can be satisfactorily settled.

The section going south-east from Lévis to the boundary of Maine, nearly sixty miles distant, passes over Sillery rocks of the Cape Rouge section for about half this distance, which become gradually harder and more metamorphic as they approach the crystalline schists of the Buckland hills. In these schists a well defined anticlinal structure is seen, which can be followed south-west and is continuous with that seen in the Sutton mountain range. The crystalline schist range of Buckland has a breadth of about four miles, and on the east is flanked by the green slates and quarzites of Cambrian age which, however, are soon overlapped by the Cambro-Silurian slates, sandstone and dark limestone of the valley of the Daquaam and upper St. John rivers which here constitute a great stretch of generally level and thickly wooded country, which stretches across into Maine, in which direction its south-eastern limit has not been traced.

The limited extent of the Lévis formation proper can be seen in the fact that the principal area itself is no more than two and a half miles in length by one mile and a half in width, while the other area on the Island of Orleans has less than one square mile, being cut off on both sides by faults; that on the south separating it from the Sillery which is thrust upward into an apparent overlying or newer position, while the second fault on the north has placed the Lévis, by a similar overthrust, above the Trenton-Utica. The formation does not appear on the north side of the St. Lawrence, being probably cut off by the fault which passes in front of the citadel, or else, if formerly existing there, it has been removed by the denundation which has been very great over the whole of Eastern

Quebec. This is evidenced by the fact that small portions only have escaped as in the case of the beds at Lévis, and also in that of certain limited areas of Silurian and Devonian rocks, among which may be mentioned those on the Chaudière and at other points inland.

From the relation of the fragments of the Lévis formation which yet remain, it is evident that the whole Quebec group after deposition has been crumpled and folded on a most extensive scale, many of the foldings being complete overturns; and that the direction of the pressure has been from the south-east. It is evident therefore that the presence of apparently conformable areas of newer strata may be looked for at many points, and this is precisely the case as seen in the study of the rocks in this field, where not only the Lévis beds but the Chazy-Trenton and even Upper Silurian formations are intimately associated with the oldest rocks of the whole series. Beautiful illustrations of this can be seen at Richmond and in the country south of Melbourne, where the Cambro-Silurian fossiliferous limestones occur, as an integral part of the schists of pre-Cambrian age and where, owing to one of the great overthrust faults, the fossiliferous rocks now occupy an inferior stratigraphical position. On the shores of Memphremagog lake also the Upper Silurian beds are so completely overturned beneath the Trenton-Chazy that, were it not for finding the characteristic fossils of the formation no one could from the stratigraphy, or from the character of the rocks at this point, assert the newer age of the Silurian portion.

The period of the crumpling therefore of much of this great series of rocks must have been comparatively recent. On the Chaudière, in Beauce Co., fossiliferous Siluro-Devonian rocks occupy a basin-shaped area of no great extent—but in cleavage, conforming to the underlying Cambro-Silurian and Cambrian rocks, and in their alteration have assumed even the character of schists, in which, however, the fossils can be easily recognized. The Silurian rocks of Dudswell and certain sections south of Sherbrooke are illustrations of the same kind, and show clearly that all have been involved in the general scheme of folding. At Dudswell the ordinary fossiliferous Silurian limestones have been changed to a highly crystalline marble, while in other places a schistose structure has been imparted.

It is important to note in this connection that in the area east of the St. Lawrence two series of stratigraphic conditions are plainly seen. Thus from a point a few miles south of Quebec city, a well defined line of fault crosses the river and can be traced continously south-west to the foot of Lake Champlain. This is the great St. Lawrence and Lake Champlain fault described in the Geol. Can., 1863, p. 234, and which, east of Quebec continues down the St. Lawrence to Cape Rosier as already stated. The strata to the east of the fault are all affected by the disturbances already described. Those to the west, with the exception of the strata in the immediate vicinity of the fault, are nearly as horizontal as when first deposited. This horizontality of the measures west and north of the fault extends from the New York boundary northward, and eastward to the island of Anticosti. The age of this fault which probably was not far removed from the period of crumpling can be very closely determined; thus, it is certainly newer than the Loraine, since it affects these beds south of the city of Quebec, separating them from the Sillery. It is very probably not far from the intrusion of the doleritic mountains of Montreal and the country eastward, which is not far from the Lower Helderburg time, though we have no formations in the vicinity of later date to limit it definitely in this direction, and it may therefore be generally stated that these great lines of fracture took place not far from the close of the Silurian period, since as already shewn the Silurian strata have been involved in the

crumplings which affect this area. There may, however, have been crumplings of strata previous to this, and probably were in connection with the outflow of the sheared dioritic green schists along the flanks of the Sutton mountain anticlinal.

Two principal lines of faulting are visible east of Montreal, one of which is that just described, and which is certainly the most important, but from this a second or branch fault about twelve miles east of Three Rivers, extends south-west, approximately parallel to the main fault, but a few miles to the west of it. By this the Hudson River and Loraine shales are brought into contact with the Chazy-Trenton, as seen at St. Dominique and Stanbridge, as well as in the St. Francis river and other places. From the separation from the main fault at the point indicated, this second fault can be easily recognized. Certain other minor lines of fracture also occur, and it is very probably that the series of eruptive masses between the St. Lawrence and Memphremagog lake have come to the surface along well defined breaks in the crust of the earth. Thus a very important line of fracture by which the Chazy is brought against the Cambrian extends from a point two miles west of Frelighsburg to the line of the Grand Trunk, in which the great masses of the Shefford, Gale and Brome mountains are situated. To the east of the Sutton mountain range also, a very heavy line of fault can be traced from Danville and Melbourne to the Vermont boundary in Potton, which separates the Cambrian from the Chazy-Trenton, and along which the great eruptive masses to the west of Lake Memphremagog have reached the surface.

The great system of crumpling just described as effecting the Sutton mountain area and the country for some miles on either side, extended to the boundary of Maine, in which distance two other axes of crystalline schists overlaid by Cambrian rocks are brought to view. Of these one is that observed at Sherbrooke, and easily traceable for fifty miles in either direction to the north and south-west; the other is near the eastern boundary of the province. The country rock of the intervening synclinal has also experienced a great series of overturnings, the prevailing dips in this part of the section being to the north-west, and certain beds are many times repeated. The detailed description of these rocks will be found in the 'Geological Report for 1886,' pp. 21 and 22 J. The impossibility of drawing any hard and fast line between the Cambro-Silurian and the Cambrian in this direction is recognized in the almost entire absence of fossils, except in the upper portion of the former. The Lévis and Sillery formations are not there, in so far as known, anywhere developed. The paper of Prof. Lapworth on "The Graptolites of the Lower Palæozic Rocks of Quebec," published in the 'Transactions of the Royal Society of Canada,' 1886, has been the subject of considerable discussion as regards the determination of horizons in this great series of strata. It must, however, be remembered that, at the date of Prof. Lapworth's writing, the facts of stratigraphy which we now possess were not available, nor was the separation of the fossiliferous Lévis from the Lauzon and Sillery attempted, or at least it was not carried out to any very great extent. In the publications of the survey, following the determinations of Hall and Logan, the Lévis, Sillery and Lauzon were apparently displayed at many points along the shore of the St. Lawrence, and it was hard to say what should, with accuracy, be styled Lévis as distinct from the other two divisions. A certain amount of confusion arose also from inaccurate labelling of the fossils, and fossils from certain areas obtained from strata closely infolded stratigraphically, but widely separated in point of time, were sometimes regarded

and labelled as belonging to the same series. As the determinations of Hall, in 1855, were made on specimens obtained before the stratigraphical sequence was properly understood, and, in fact, while the whole of the series was regarded as representing the Hudson River formation of the New York geologists, and as to a certain extent the same remarks apply to the collections examined by Lapworth, it is but natural to expect that a certain amount of confusion should exist.

In regard to the determination of the graptolites, it must, however, be admitted that this paper of Lapworth's is of very great value. The relative positions of the zones, as determined by the limited number of fossils submitted to him, since, however, largely increased, has been very closely confirmed by the most recent stratigraphical conclusions; and when certain at present somewhat obscure points are more carefully worked out, there will probably be but little to correct in the determination of the organic remains from this group. In the grouping of strata, as given in his paper, however (see p. 174), certain corrections must be made, since he has there included in the upper part of his lower division (*C*), a Lévis division of the Cambro-Silurian above the Lévis graptolites, a great part of the Sillery beds which we now know to be beneath the Lévis stratigraphically; while in the Cambrian division (*B*), he has incorporated a part of the same Sillery formation. This error plainly arises from following the divisions published in 'The Geology of Canada,' 1863, p. 227, too closely.

With these exceptions, the stratigraphical arrangement as contained in pp. 173-175 of his paper will be in very close conformity with that lately published in the Geological Survey reports, and which may be briefly summed up as follows:

1st and at the base. The crystalline schists of Sutton mountains, the Buckland hills and the Shickshock range, of pre-Cambrian age.

2. The green, black and purple slates, often quartz veined with hard quartzites, shading upward into the red and green shales and green sandstones and limestone conglomerates of the Sillery, with *Obolella pretiosa*, Lingula, sponge spicules and small trilobites, Agnostus, etc., and in the pebbles of the conglomerate *Olenellus Thompsoni* and other Lower Cambrian trilobites, the whole of which can be classed as of Cambrian age.

3. The green, grey and black fucoidal and graptolitic shales of the Lévis formation, with their associated characteristic limestone conglomerates, in which the pebbles contain fossils of Potsdam age and the matrix others peculiar to the Calciferous formation. These constitute the lowest members of the Cambro-Silurian or Ordovician system, and are the stratigraphical equivalents of the Calciferous formation found in the lower part of the Philipsburg section and in the state of New York.

4. The dolomitic slates and limestone conglomerates of Stanbridge township, with certain black and grey slates, which form the upper part and in which the characteristic of the township fossils are of Chazy age.

5. Black limestones and slates of Farnham, Richmond, Danville, Hatley, Eaton, etc., also fossiliferous and abounding in graptolites in certain places of Trenton age, and, possibly, in part of the Trenton-Utica. To these, also, may for the present be assigned the rocks of the city of Quebec, of the north-west end of the Island of Orleans, the patches of Trenton-Utica seen on the north side of Gaspé peninsula and the great stretch from Marsouin river to near Cape Rosier (Marin Brook).

6. The Utica-Loraine, seen to the north of Quebec, at Montmorency Falls, and on the south shore of the St. Lawrence, west of the great Champlain fault from the contact south of St. Nicholas to Lake Champlain.
7. The Silurian—embracing the areas of reddish sandstone and shales east of the St. Lawrence, apparently devoid of fossils, but of supposed Medina age; the slates and limestones of Dudswell, and the St. Francis valley north of Sherbrooke, and the area in the vicinity of Memphremagog lake; the whole characterized by fossils of upper Silurian age, from the Niagara to the lower Helderburg, both inclusive.
8. Certain areas of limestone on the Chaudière, in Langevin and on the peninsula of Gaspé, which may be regarded from the contained fossils in part as Siluro-Devonian, and which graduate upward into the sandstones and shales of the Oriskany, forming areas of considerable extent, both along the Gaspé coast and throughout portions of the interior of that peninsula.

Of writers in the United States, those who have most recently discussed the question of Canadian geology, as presented south of the St. Lawrence and in the vicinity of Quebec, are Profs. Walcott and Jules Marcou. For the purpose of comparison, the latest views of these writers on the subject may be subjoined.

Prof. Marcou, in his paper "Canadian Geological Classification for the Province of Quebec," published in the 'Proceedings of the Boston Society of Natural History' in 1889, after discussing the various opinions held from time to time by the different workers in this field, states his views as to the stratigraphy of the Province of Quebec.

In this the formations below the Silurian, are arranged as follows:

"*Utica*, from Rouse's Point to St. John's Lake. 4th zone of graptolites."

"*Trenton*, including Chazy and Calciferous, not distinguishable as subdivisions from Chicot Creek, (St. Peters' Lake) eastward to Montmorency and Western Newfoundland."

"*Break*, unconformity at Chazy and Beauharnois."

"*Potsdam*, does not exist round Three Rivers, nor the city of Quebec nor farther east. It exists only round Montreal as far north-east as St. Cuthbert, in Berthier county."

"*Break* and overturn of all the slates and strong unconformity."

"*Citadel Hill and Quebec City*, or *Swanton Slates*. Third zone of graptolites and colonies."

"*Point Lévis and Philipsburg*. Second zone of graptolites, colonies."

"*Georgia*, from Highgate, Vt. to St. Denis, Bic harbour, etc.; first zone of graptolites. Olenellus belt."

"*St. Albans*, much developed in the Chaudière, and around Actonvale and Richmond. A few Olenellus forms exist east of St. Albans, west of Shelton and in the granular quartz. This formation represents the Olenellus bed of Cape Breton, East Newfoundland and Scandinavia."

Without indulging in any lengthy criticism of Prof. Marcou's classification, it is but fair to say that the work of the last three years about Quebec and in the Eastern Townships has revealed sufficient facts regarding the structure to warrant the statement that in some points the arrangement of his divisions does not correspond with the stratigraphy or the fossil evidence. Thus, first, in the division Trenton, the Chazy and Calciferous are

clearly distinguishable from the Trenton proper at several points, as shown by the large collections of fossils made within the last two years both by Prof. Walcott and myself.

Second, the placing of the citadel rocks and of the Point Lévis graptolitic and conglomerate beds beneath the Potsdam cannot be maintained, since, as regards the former, the evidence of the fossils, as established by Lapworth, Ami and others, shows the zone of those rocks to be more closely related to the Trenton rocks than to the Potsdam, and to be, for the most part at least, above the Lévis formation, and therefore far above the Potsdam, since it has been clearly shown that the Lévis conglomerates in undoubted foreign boulders of the conglomerates carry fossils of the Potsdam age, while the fossils in the paste or matrix are not lower than the horizon of the Calciferous. Both these divisions must therefore in their stratigraphical arrangement be placed above the Potsdam. And, third, the rocks of Bic, St. Denis and the Chaudière, while carrying *Olenellus Thompsoni* and other primordial fossils, have these only in boulders derived from some distant source, or at least from no rocks *now* in the vicinity, and consequently should be placed in the upper part of the Cambrian system.

The observations of Prof. Walcott on certain fossils peculiar to the Cambrian rocks, as given in his elaborate work, "The Cambrian Faunas," published as 'Bulletin No. 30, United States Geological Survey, 1886,' throws some light also upon the age of the lower division of the fossiliferous Quebec group. Thus the peculiar fossil Obolella, of which presumably two are known in the upper and middle Sillery, is distinctly stated to be characteristic of the middle and upper Cambrian.[1] In so far as our observations have extended on the fossils of this group, Obolella has not been observed in any beds above the red shales of the Sillery division, though in the beds of this division and in those underlying the red portion, viz., the black, grey and green shales of Division 2 of the Cape Rouge section, Obolella and graptolites are found at several points. Of the Cambrian age of the lower portion of the Cape Rouge section there can be no doubt, and it is equally clear that the whole section from Division 1 upwards to the Lévis formation is a gradually ascending one with no well defined break, at least in so far as the study of a number of sections has shown. Subsequently, in the review of my report of 1888, Prof. Walcott, while agreeing with the conclusions of stratigraphy there stated, supposed that the upper member of the Sillery may form the lowest portion of the Ordovician, representing the lowest Calciferous horizon. The difficulty of drawing any hard and fast line between the rocks of the Cambrian and Cambro-Silurian systems as displayed in the Quebec group was pointed out in the report referred to, and the line as fixed at the time was principally owing to the recognition of the Calciferous horizon of the Lévis beds and the well marked break in the fossils between these and the directly underlying red and green slates and sandstones of the Sillery, which break was held to form the most convenient line of separation of the two systems. In Prof. Walcott's Bulletin, 1886, however, referred to on page 63, in his classification of the North American Cambrian rocks, he regards the lower portion of the Calciferous formation of New York and Canada as properly belonging to the Upper Cambrian, the Potsdam forming the lower portion of that division, so that in this evidence, also, the conclusions already stated in this paper, as regards the division and relative age of the Quebec group rocks, are, it is held, clearly sustained.

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[1] "Cambrian Faunas," 1886, p. 62.

ABSTRACT.

On the Mode of Occurrence of Remains of Land Animals in Erect Trees at the South Joggins, Nova Scotia.

By SIR J. WILLIAM DAWSON, LL.D., F.R.S., etc.

(Read May 29, 1891.)

The remarkable section of coal-formation rocks at the South Joggins, in Cumberland County, has long been known as one of the most instructive in the world; exhibiting as it does a thickness of 5,000 feet of strata of the coal-formation in a cliff of considerable height, kept clean by the tides and waves, and in the reefs extending from this to the shore, which at low tide expose the beds very perfectly. It was first described in detail by the late Sir. W. E. Logan,[1] and afterwards the middle portion of it was still more detailed by the author, more especially in connection with the fossil remains characteristic of the several beds and the vegetable constituents and accompaniments of the numerous seams of coal.[2] It was on occasion of a visit of the author in company with Sir Charles Lyell, and in the pursuit of these investigations, that one of the most remarkable features of the section was disclosed in 1851. This is the occurrence, in the trunks of certain trees imbedded in an erect position in the sandstones of Coal-mine Point, of remains of small reptiles, which, with one exception, a specimen from the Pictou coal-field, were the first ever discovered in the carboniferous rocks of the American continent, and are still the most perfect examples known of a most interesting family of coal-formation animals, intermediate in some respects between reptiles proper and batrachians, and known as Microsauria. With these were found the first known carboniferous land snails and millipedes. Very complete collections of these remains have been placed by the author with his other specimens in the Peter Redpath Museum, and the object of the present paper was to take advantage of the meeting of the Royal Society in Montreal, in order to exhibit these specimens and to illustrate the precise mode of their occurrence and entombment.

A forest or grove of the large ribbed trees known as Sigillariæ, was either submerged by subsidence, or, growing on low ground, was invaded with the muddy waters of an inundation, or successive inundations, so that the trunks were buried to the depth of several feet. The projecting tops having been removed by subaerial decay, the buried stumps became hollow, while their hard outer bark remained intact. They thus became hollow cylinders in a vertical position and open at top. The surface having then become dry land, covered with vegetation, was haunted by small quadrupeds and other land animals, which from time to time fell into the open holes, in some cases nine feet deep,

[1] 'Report Geol. Survey of Canada,' 1844.

[2] 'Journal London Geological Society,' vol. X, pp. 1, et seq., 1853, "Acadian Geology," pp. 156, et seq.

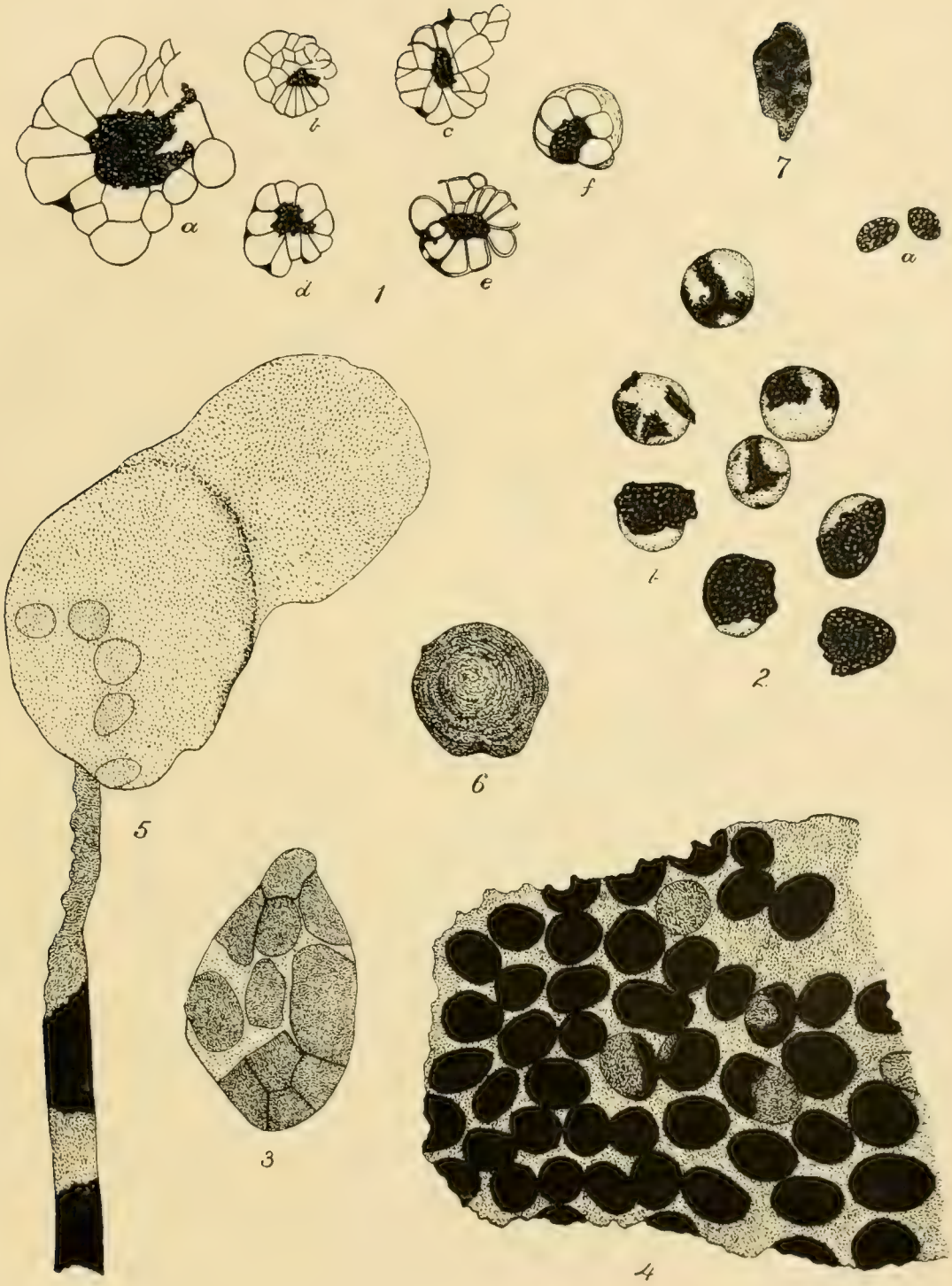
and could not extricate themselves. On their death, and the decomposition of their soft parts, their bones and other hard portions remained in the bottom of the tree intermixed with any vegetable debris or soil washed in by rain, and which formed thin layers separating successive animal deposits from each other. Finally, the area was again submerged or overflowed by water, bearing sand and mud. The hollow trees were filled to the top and their animal contents thus sealed up. At length the material filling the trees was by pressure and the access of cementing matter hardened into stone, not infrequently harder than that of the containing beds, and the whole being tilted to an angle of 20°, and elevated into land exposed to the action of the tides and waves, these singular coffins present themselves as stony cylinders projecting from the cliff or reef, and can be extracted and their contents studied.

The singular combination of accidents above detailed was, of course, of very rare occurrence, and in point of fact we know only one set of beds at the South Joggins in which such remains so preserved occur; nor is there, so far as I am aware, any other known instance elsewhere. Even in the beds in question only a portion of the trees, about fifteen out of thirty, have afforded animal remains. We have, however, thus been enabled to obtain specimens of a number of species which would probably otherwise have been unknown, being less likely than others to be preserved in properly aqueous deposits. Such discoveries on the one hand impress us with the imperfection of the geological record; on the other, they show us the singular provisions which have been made in the course of geological time for preserving the relics of the ancient world, and which await the industry and skill of collectors to disclose their hidden treasures.

There is evidence in coprolitic matter on some of the surfaces within the trunks, and also in certain trails on these surfaces, that some of the imprisoned animals lived for a time in their subterranean prisons; that they crept around their walls in search of a way of escape, and that the larger animals fed on smaller species entrapped along with them.

Specimens and photographs were exhibited of two species of *Dendrerpeton*, belonging to the group of Labyrinthodontia, and of species of *Hylonomus*, *Hylerpeton*, *Smilerpeton*, *Fritschia*, etc., belonging to the group of Microsauria; also two species of *Pupa*, remains of several species of Millipedes and fragments referred to Scorpions.[1] For detailed descriptions of the animals reference was made to the author's "Acadian Geology" and "Airbreathers of the Coal Period," and to his memoir in the 'Transactions of the Royal Society of London,' 1882, and to recent papers in the 'London Geological Magazine,' 1891.

[1] These specimens are now in the collections of Sir W. Dawson, deposited in the Peter Redpath Museum.



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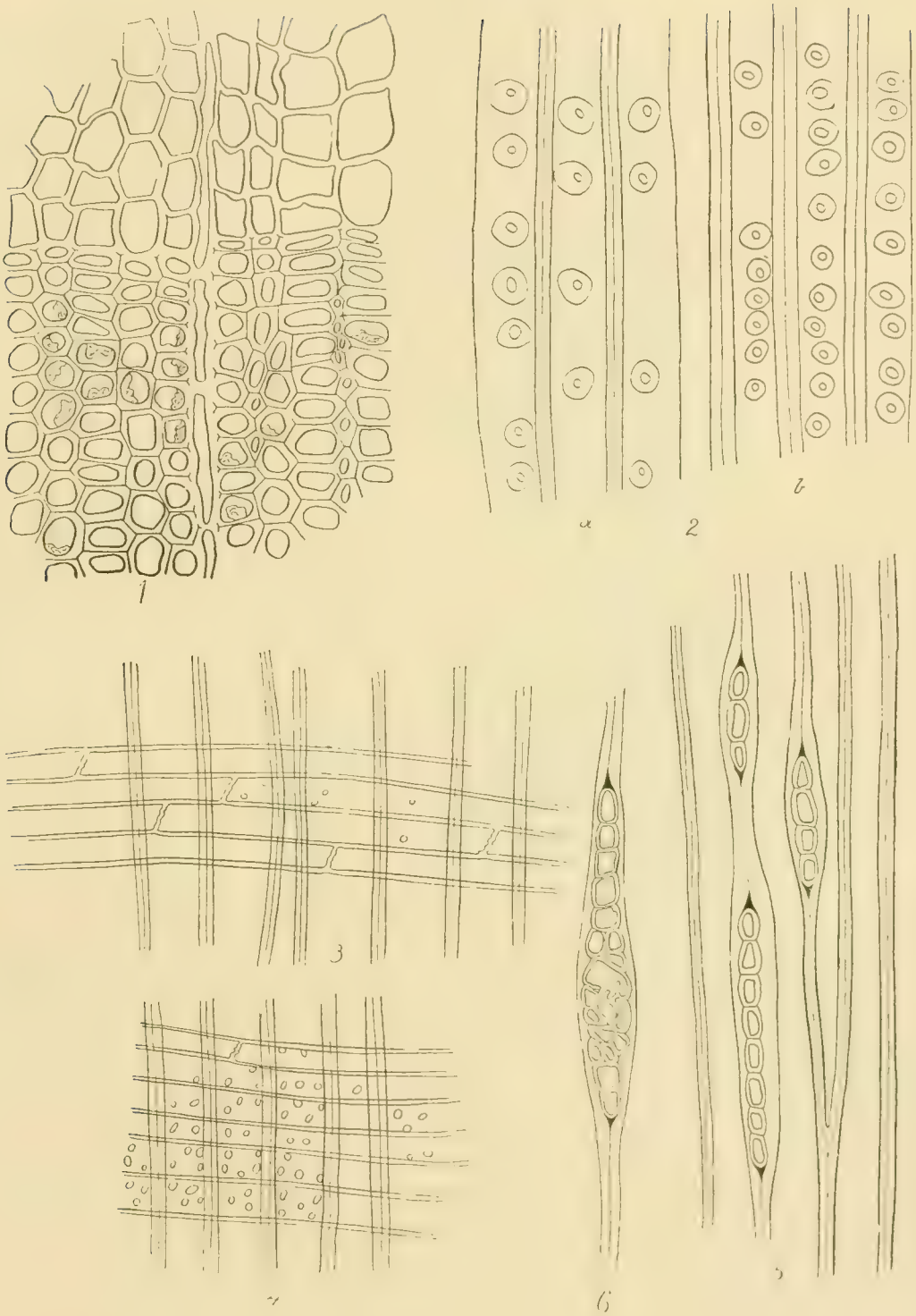

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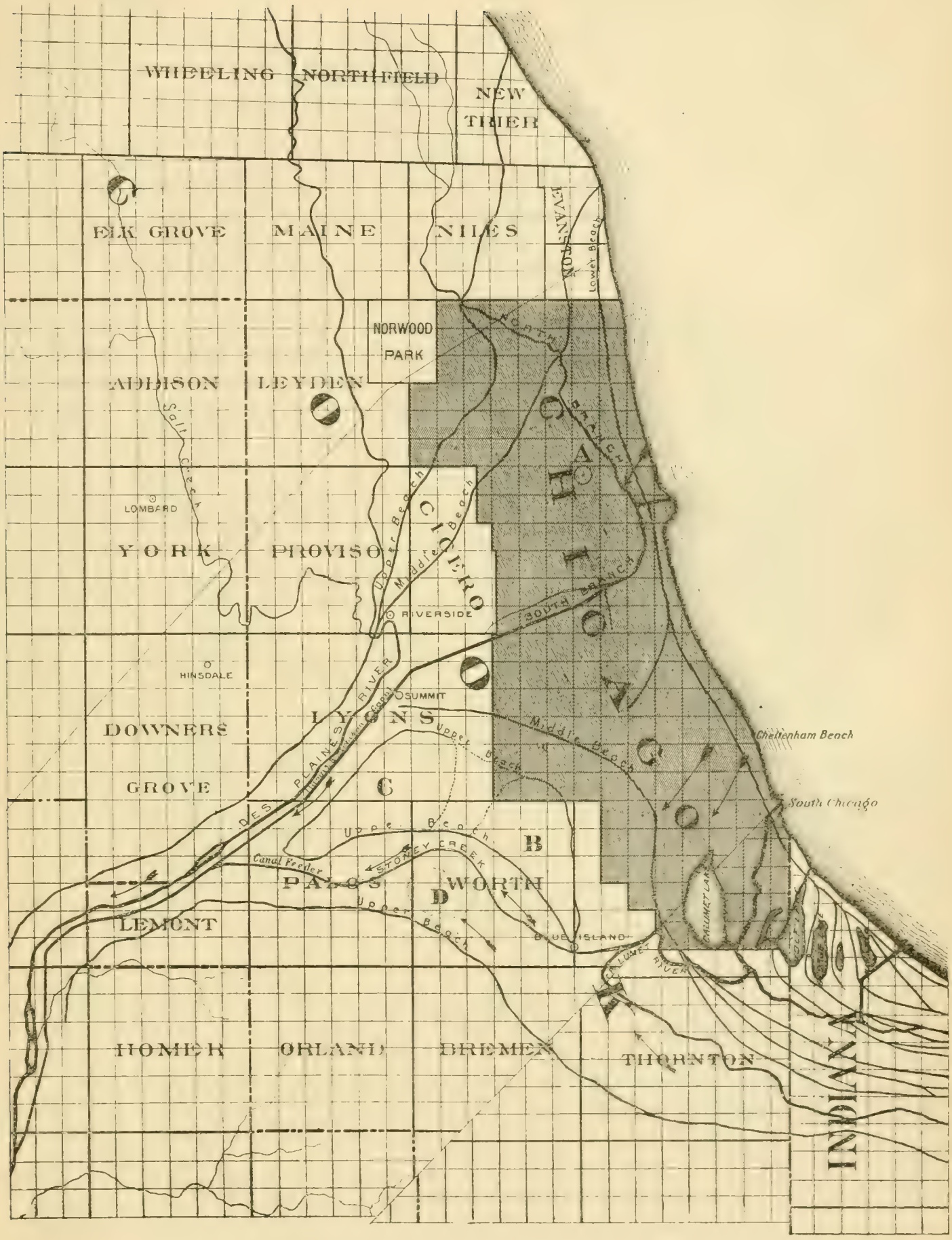

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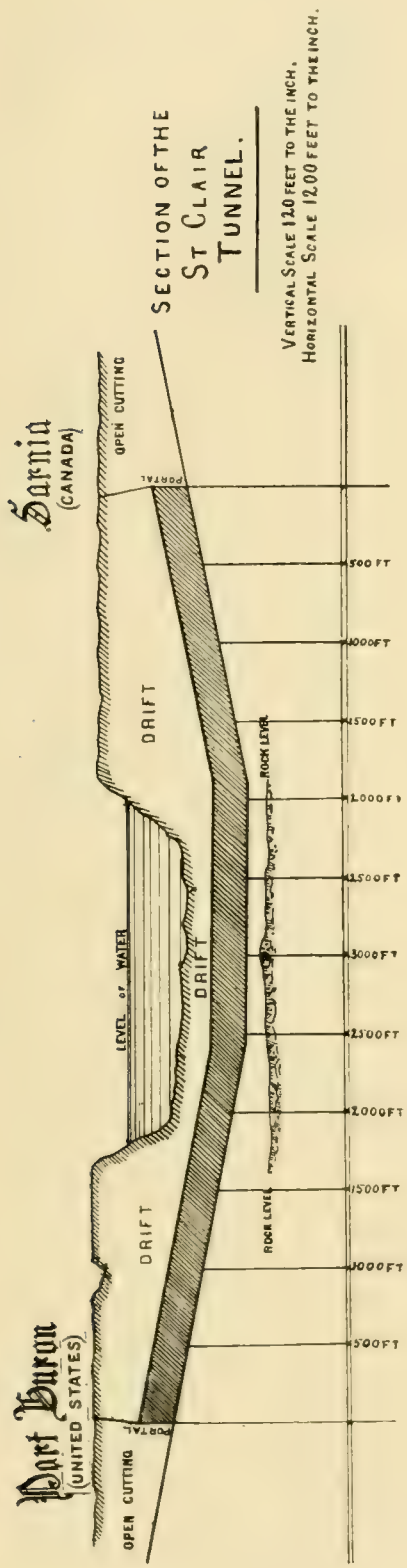

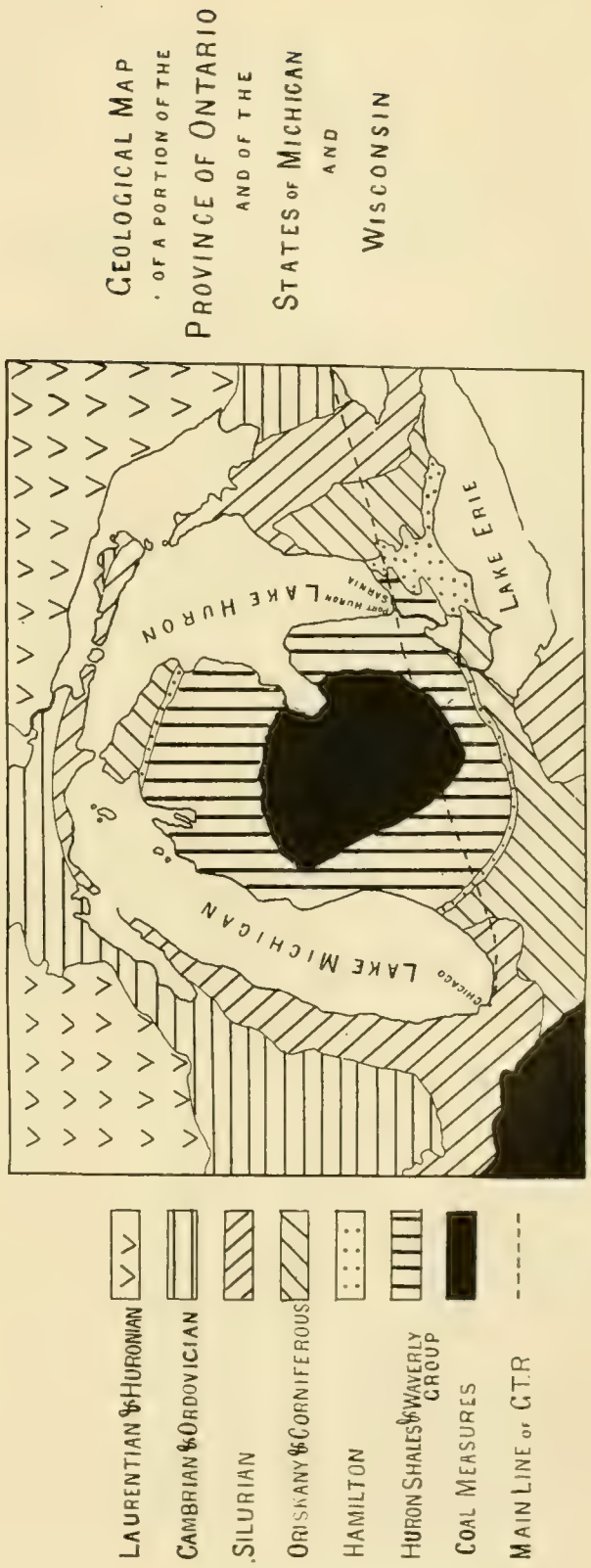

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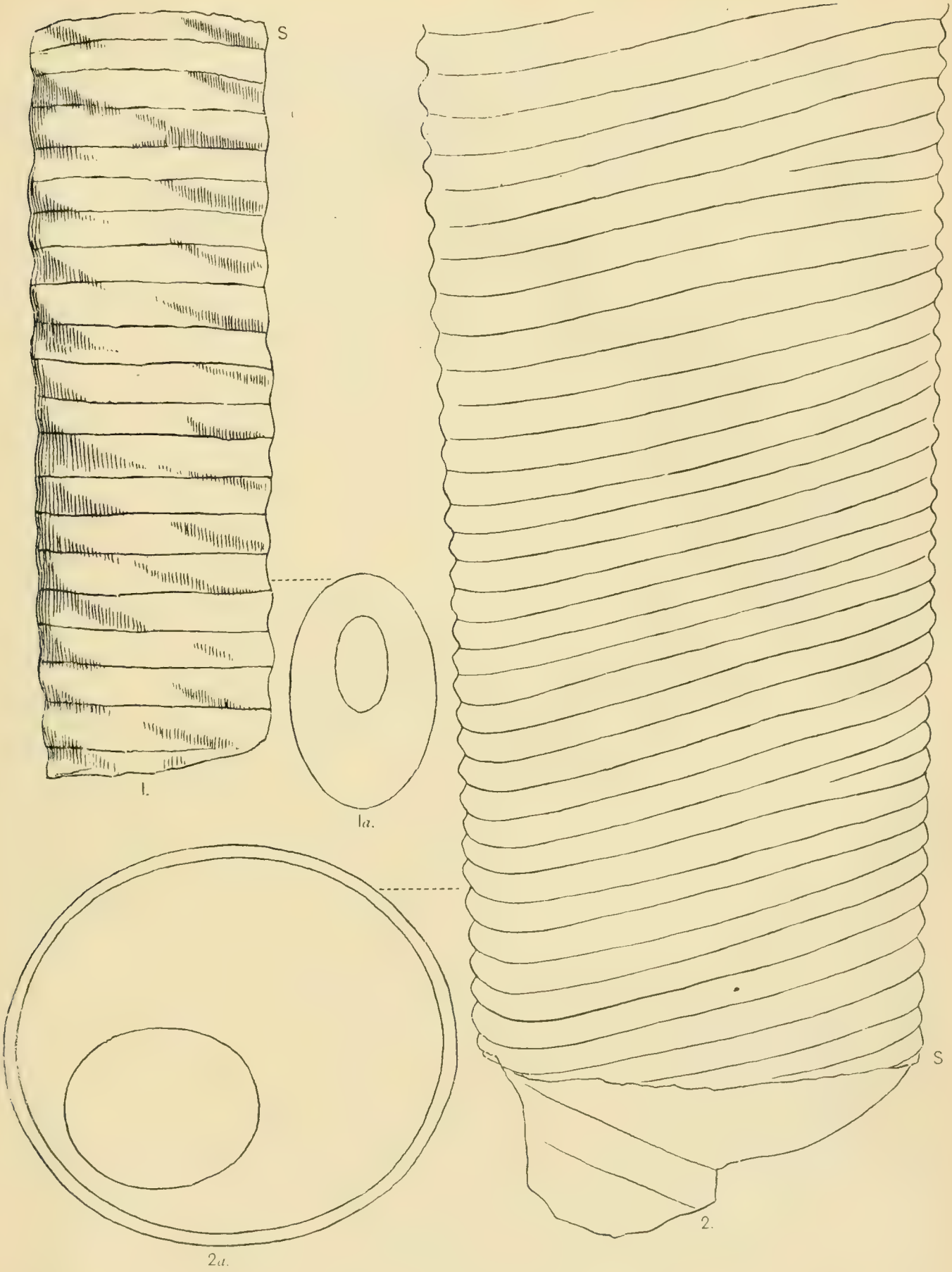

L. M. LAMBE, F.G.S., DEL

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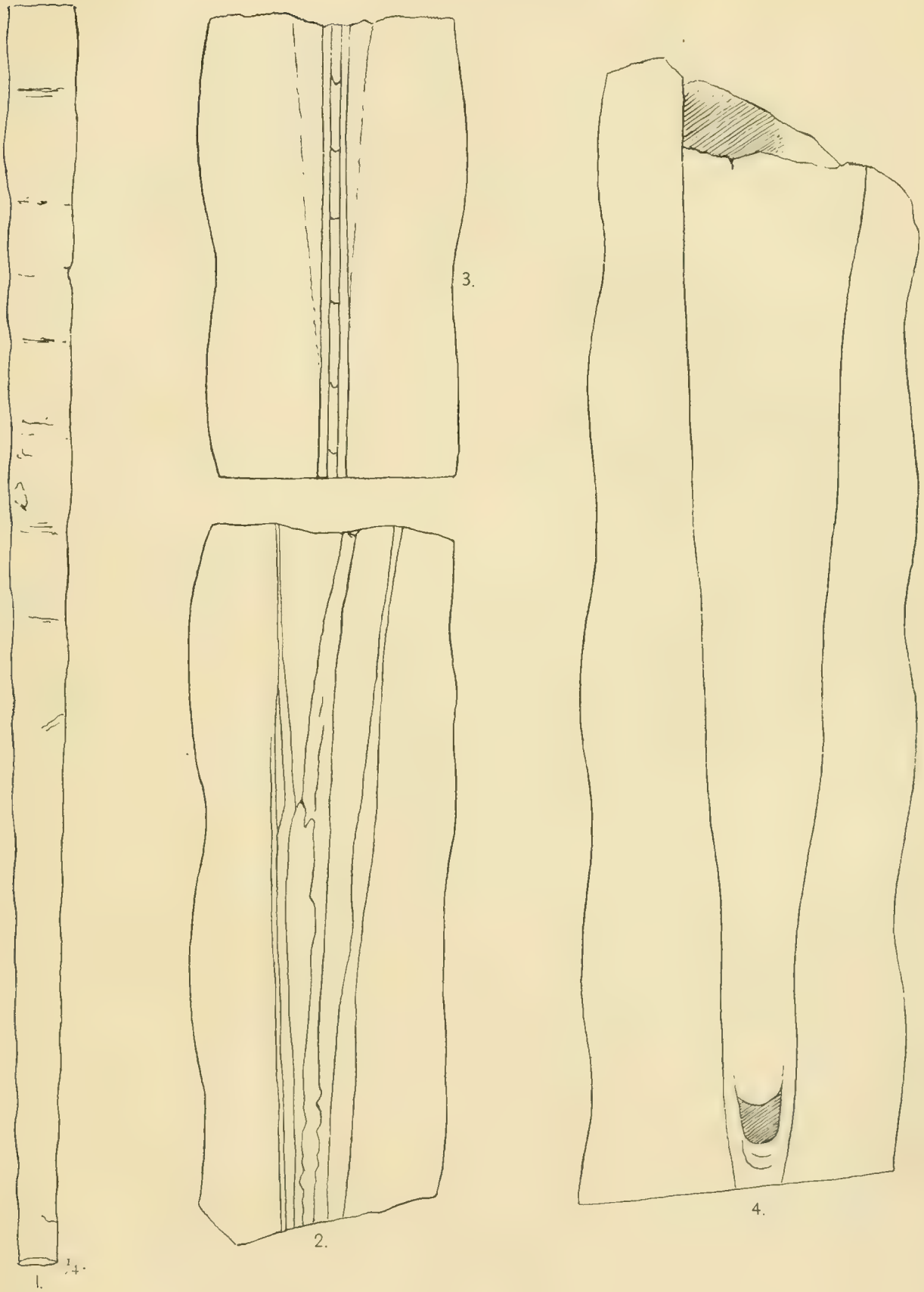

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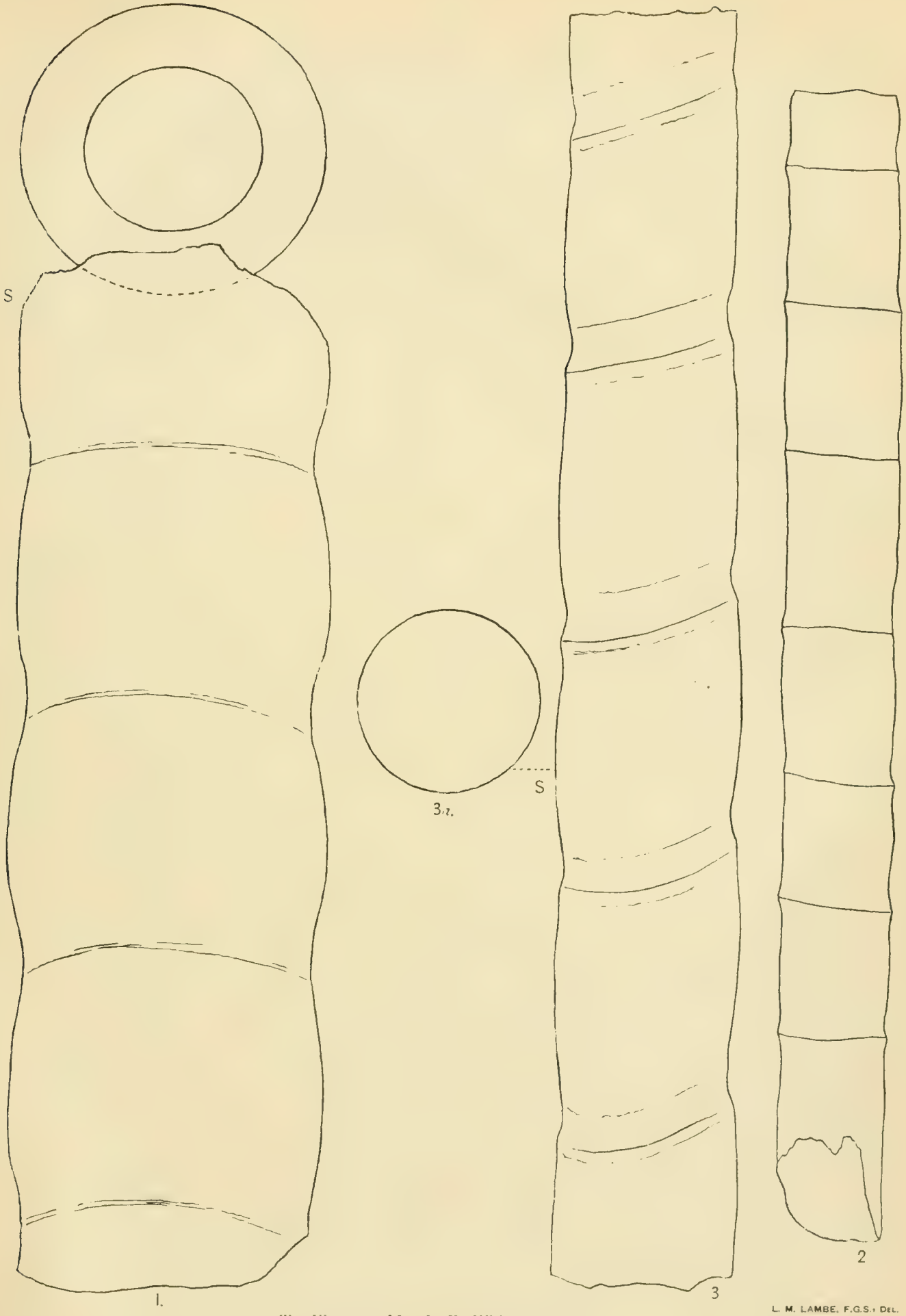

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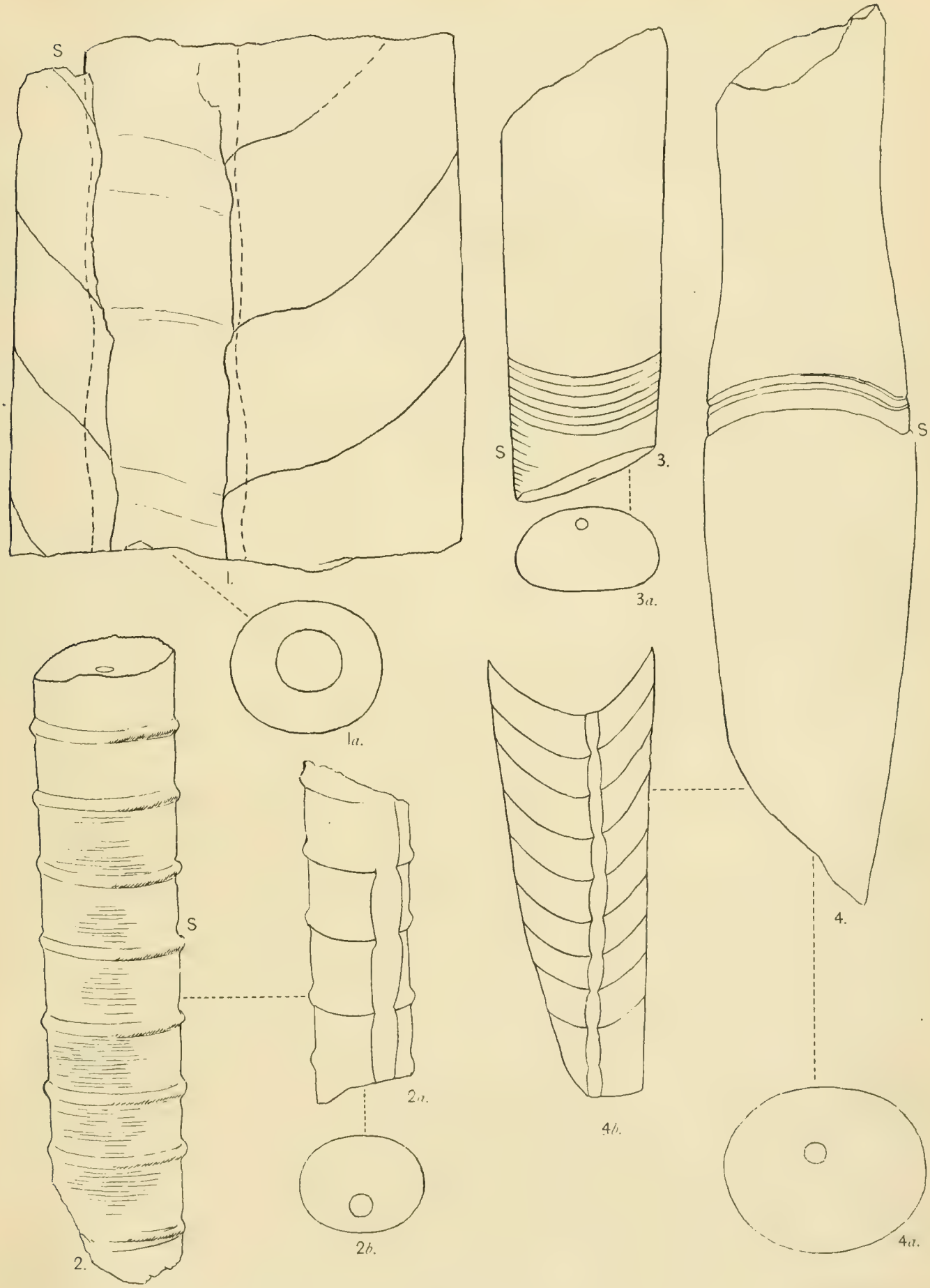

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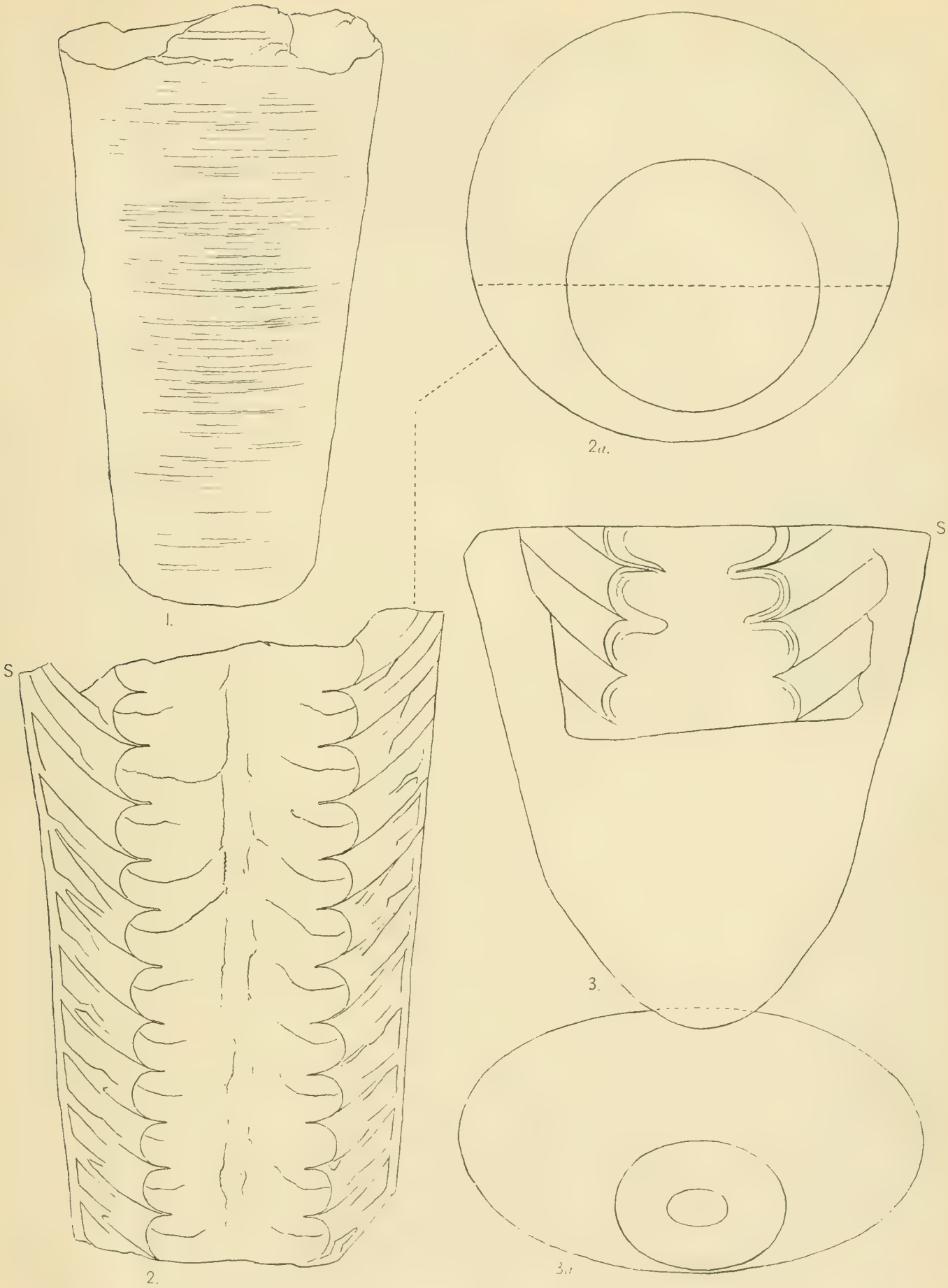

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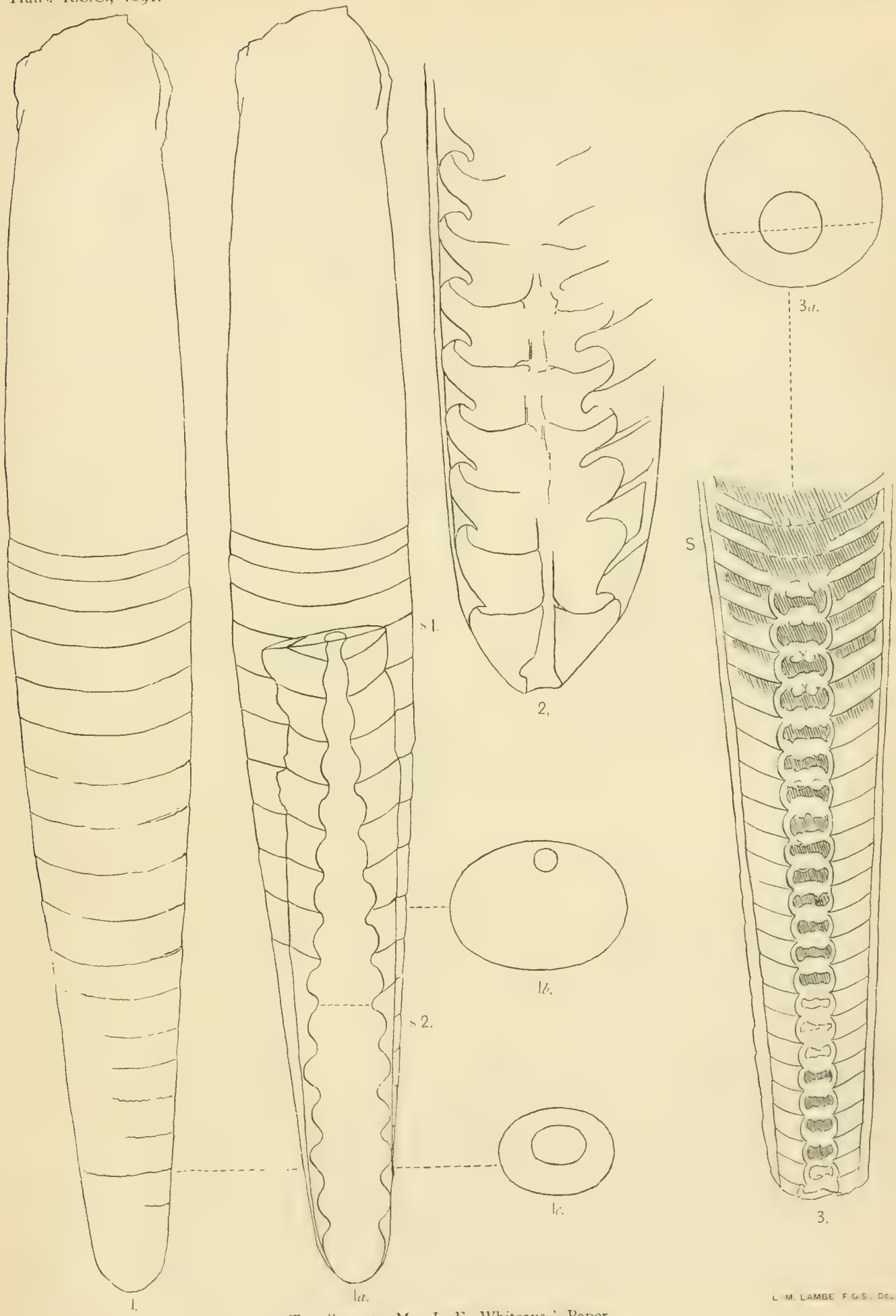
To Illustrate Mr. J. F. Whiteaves' Paper.



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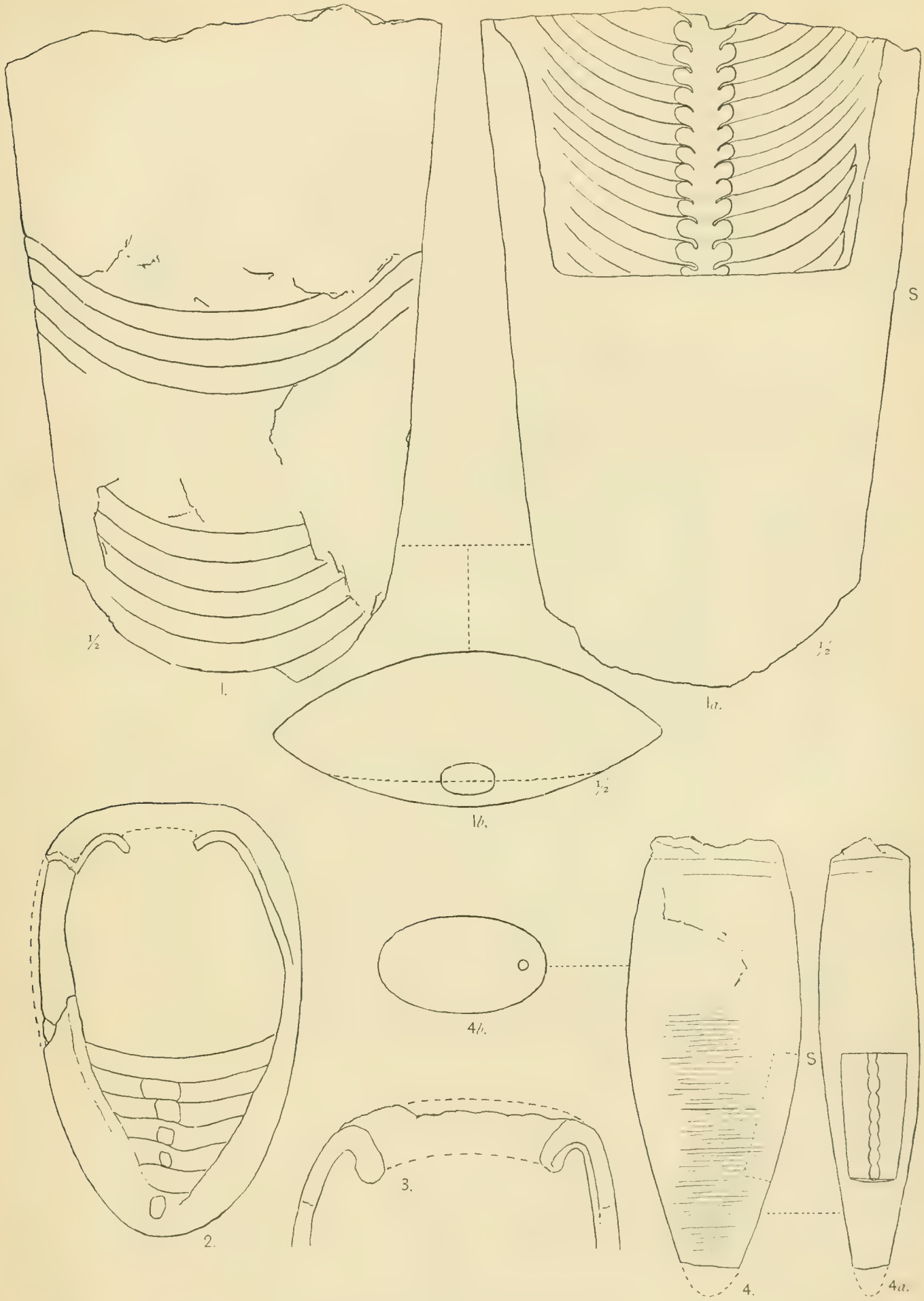

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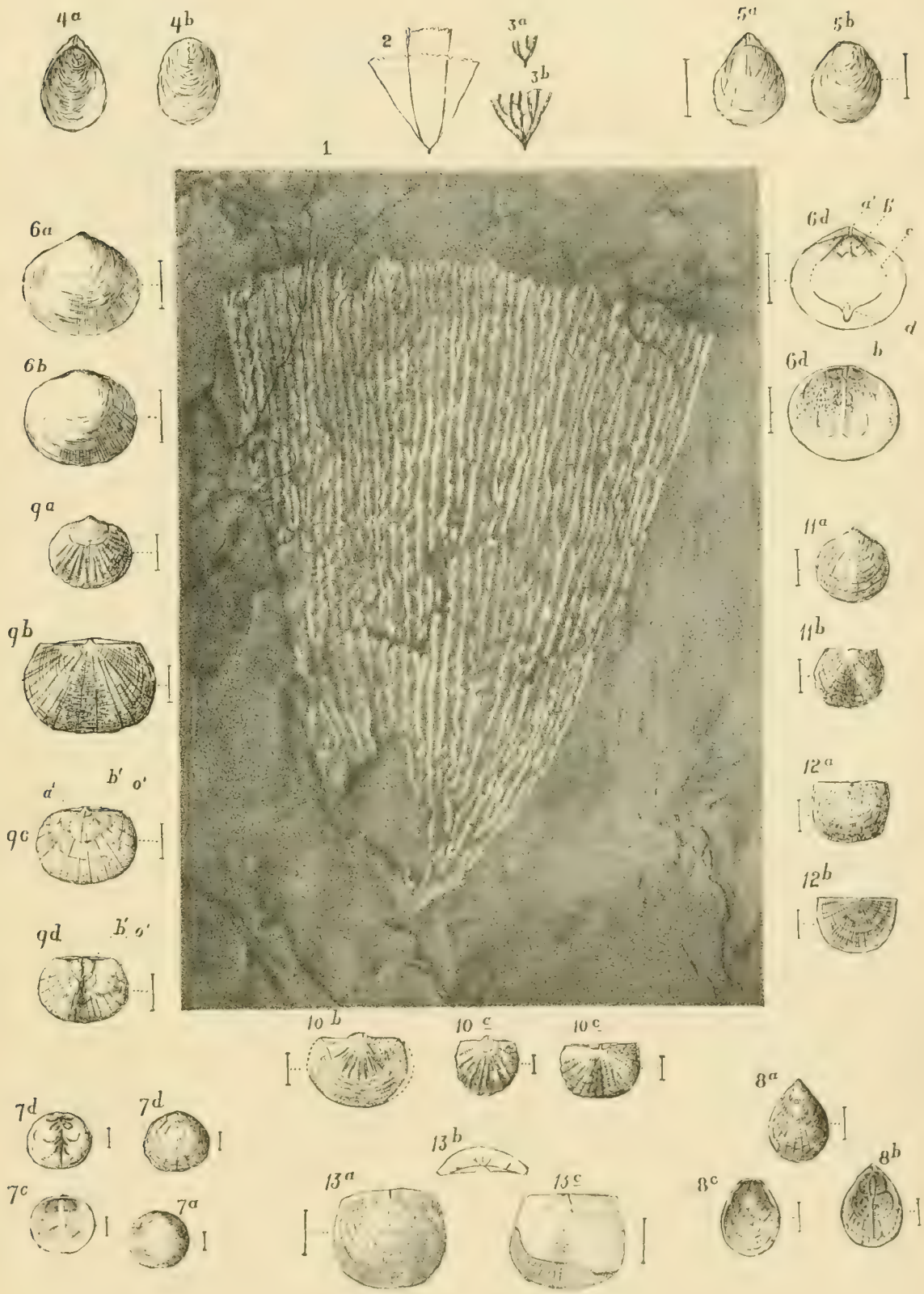
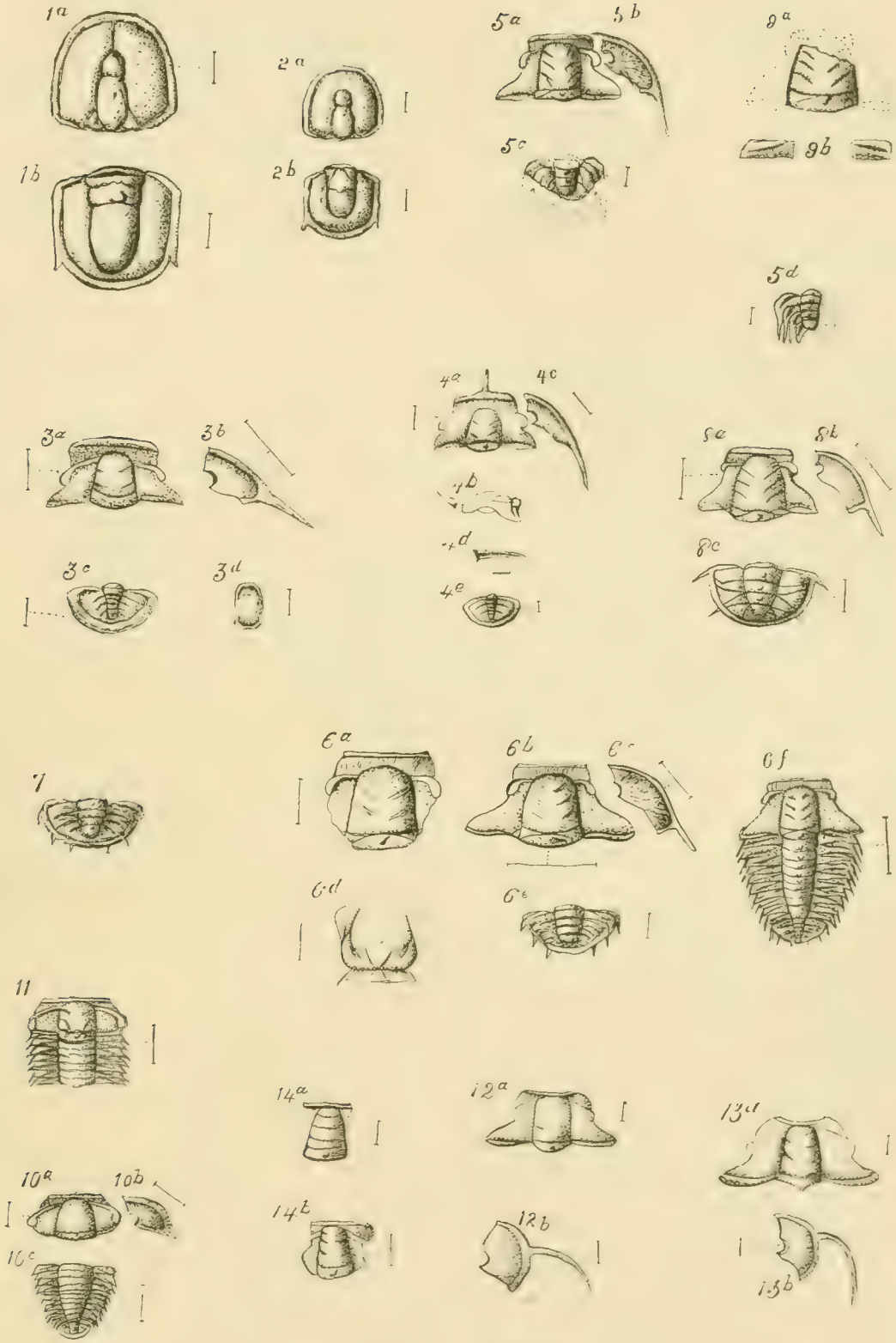
Hydroida and Brachiopoda.



To illustrate Mr. G. F. Matthew's Paper.

Trilobita.



To illustrate Mr. G. F. Matthew's Paper.

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